

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Sorrells *et al.*

Appl. No. 09/855,851

Filed: May 16, 2001

For: **Apparatus, System, and Method
for Down-Converting and Up-
Converting Electromagnetic
Signals**

Confirmation No. 9178

Art Unit: 2681

Examiner: (to be assigned)

Atty. Docket: 1744.1260001

Letter to PTO Draftsman: Submission of Formal Drawings

Commissioner for Patents
Washington, D.C. 20231

Sir:

Submitted herewith are ninety-four (94) sheets of formal drawings with Figures 1A-1D, 2, 3A-3G, 4, 5, 6A-6B, 7A-7B, 8-12, 13A-13I, 14-15, 16A-16O, 17, 18A-18E, 19, 20A-20F, 21-23, 24A-24K, 25A-25F, 26A-26F, 27A-27E, 28-30, 31A-31C, 32-44, 45A-45E, and 46-62, corresponding to the informal drawings submitted with the above-captioned application. Identification of the drawing(s) is provided in accordance with 37 C.F.R. § 1.84(c). Acknowledgment of the receipt, approval, and entry of these formal drawing(s) into this application is respectfully requested.

It is not believed that an extension of time is required, other than any already provided herewith. However, if an extension of time is needed to prevent abandonment of the application, then such extension of time is hereby petitioned. The U.S. Patent and Trademark Office is hereby authorized to charge any fee deficiency, or credit any overpayment, to our Deposit Account No. 19-0036. A duplicate copy of this Letter is enclosed.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.

Michael Q. Lee
Attorney for Applicants
Registration No. 35,239

Date: NW 2, 2001

1100 New York Avenue, N.W., Suite 600
Washington, D.C. 20005-3934
(202) 371-2600

att. 8674

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.

ATTORNEYS AT LAW

1100 NEW YORK AVENUE, N.W. • WASHINGTON, D.C. 20005-3934

PHONE: (202) 371-2600 • FACSIMILE: (202) 371-2540 • www.skgf.com

ROBERT GREENE STERNE
EDWARD J. KESSLER
JORGE A. GOLDSTEIN
SAMUEL L. FOX***
DAVID K.S. CORNWELL
ROBERT W. ESMOND
TRACY-GENE G. DURKIN
MICHELE A. CIMBALA
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TIMOTHY M. SPEER**
AARON L. SCHWATZ**

*LIMITED TO MATTERS
AND PROCEEDINGS BEFORE
FEDERAL COURTS & AGENCIES
**REGISTERED PATENT AGENT
***SENIOR COUNSEL

November 2, 2001

WRITER'S DIRECT NUMBER:

(202) 371-2674

INTERNET ADDRESS:

mlee@skgf.com



Commissioner for Patents
Washington, D.C. 20231

Art Unit 2681

Re: U.S. Non-Provisional Utility Patent Application
Appl. No. 09/855,851 Filed: May 16, 2001
For: **Apparatus, System, and Method for Down-Converting
and Up-Converting Electromagnetic Signals**
Inventors: Sorrells *et al.*
Our Ref: 1744.1260001

Sir:

Transmitted herewith for appropriate action are the following documents:

1. Letter to PTO Draftsman: Submission of Formal Drawings (*in duplicate*);
2. Ninety-four sheets of formal drawings (Figures 1A-1D, 2, 3A-3G, 4, 5, 6A-6B, 7A-7B, 8-12, 13A-13I, 14-15, 16A-16O, 17, 18A-18E, 19, 20A-20F, 21-23, 24A-24K, 25A-25F, 26A-26F, 27A-27E, 28-30, 31A-31C, 32-44, 45A-45E, and 46-62), approval of which is respectfully requested; and
3. One return postcard.

It is respectfully requested that the attached postcard be stamped with the date of filing of these documents, and that it be returned to our courier. In the event that extensions of time are necessary to prevent abandonment of this patent application, then such extensions of time are hereby petitioned.

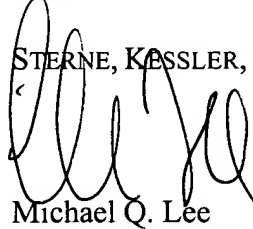
Commissioner for Patents

November 2, 2001

Page 2

The U.S. Patent and Trademark Office is hereby authorized to charge any fee deficiency, or credit any overpayment, to our Deposit Account No. 19-0036. A duplicate copy of this letter is enclosed.

Respectfully submitted,



STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.

Michael Q. Lee
Attorney for Applicants
Registration No. 35,239

Enclosures

MQL/sjc
P:\USERS\VEASTON\1744.1260001\DRAWING.CVR
SKGF Rev. 4/27/00 mac

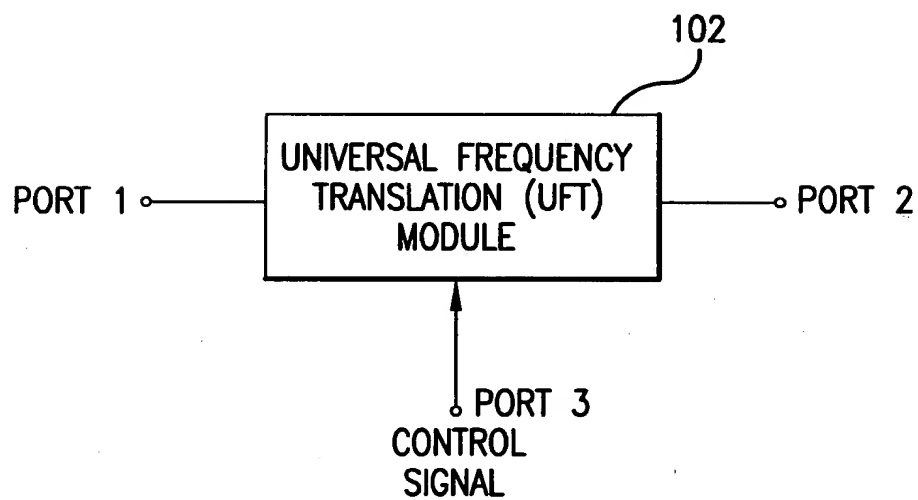


FIG. 1A

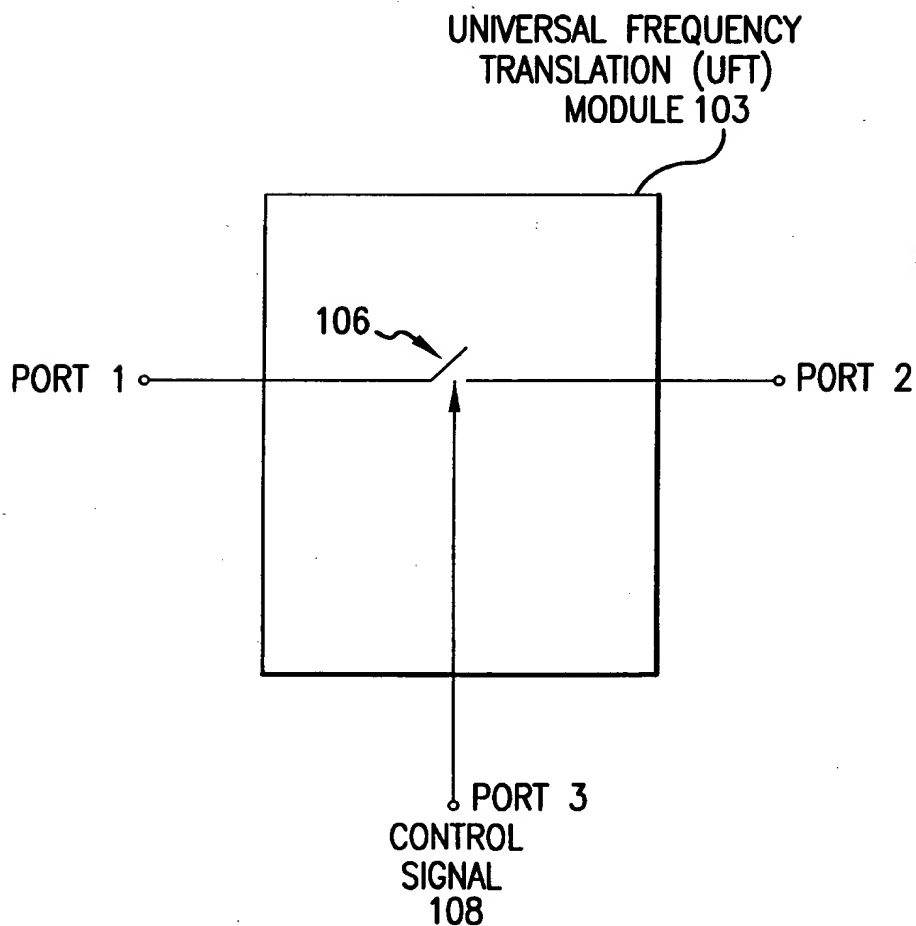


FIG. 1B

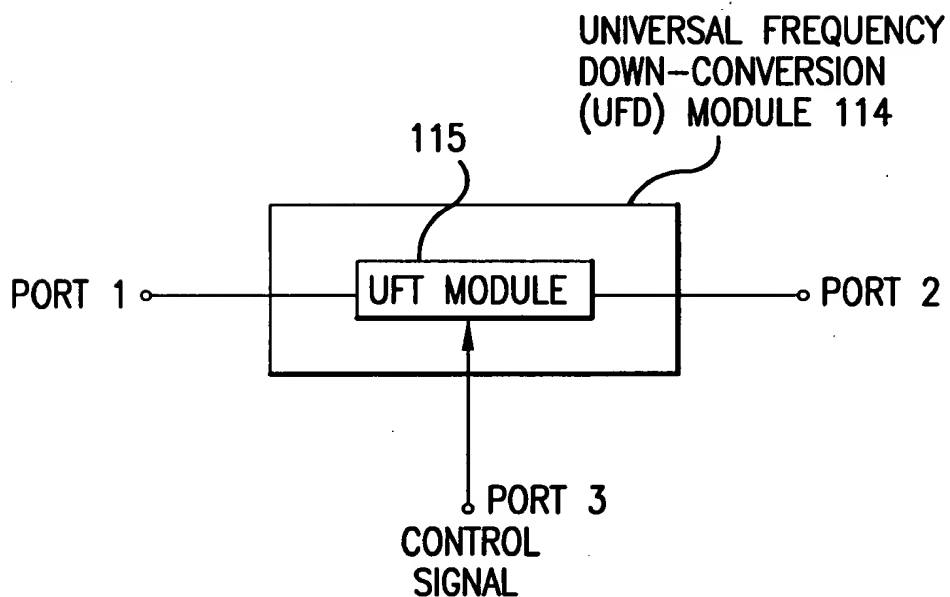


FIG. 1C

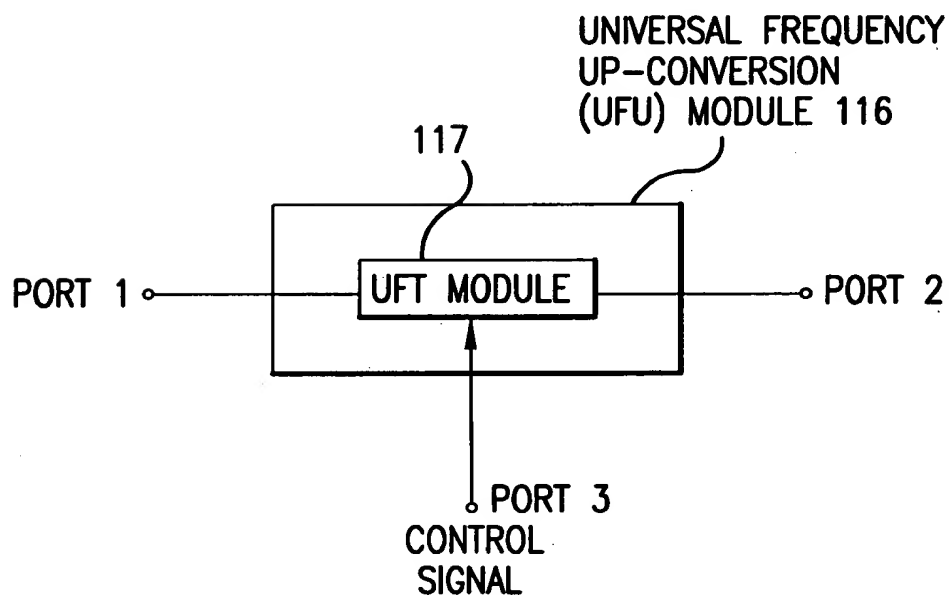
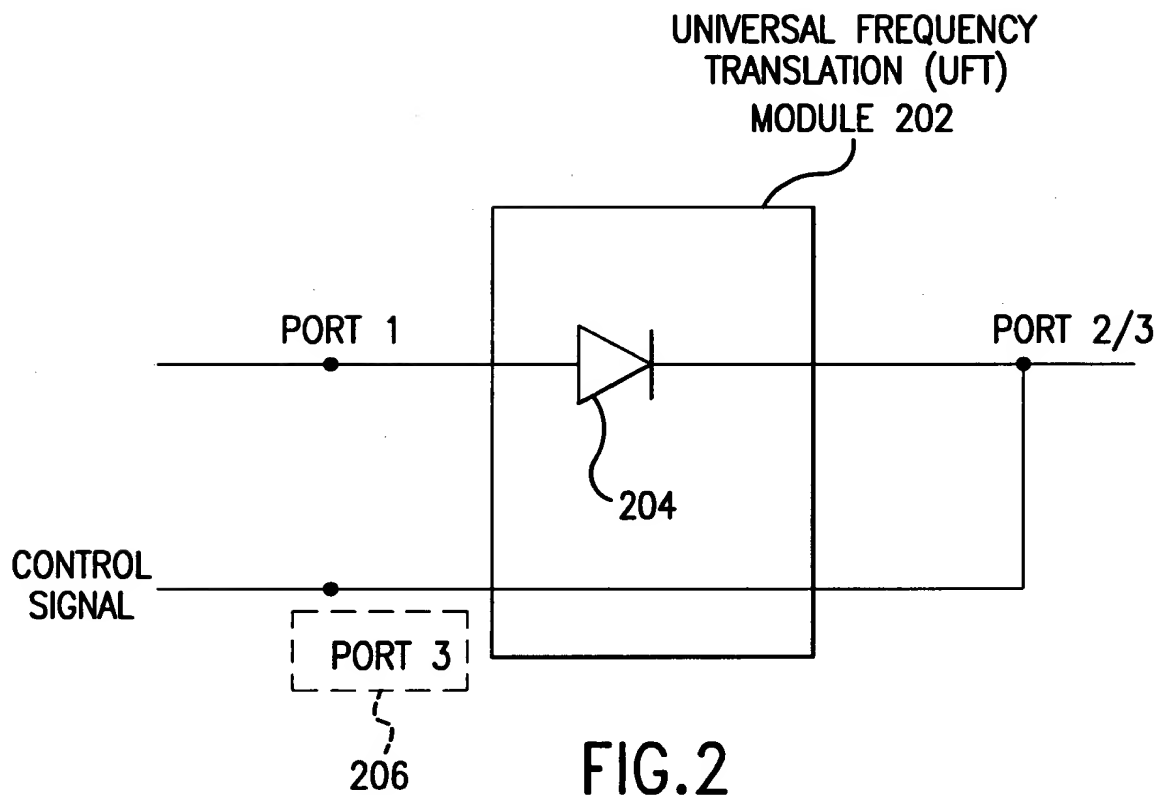


FIG. 1D



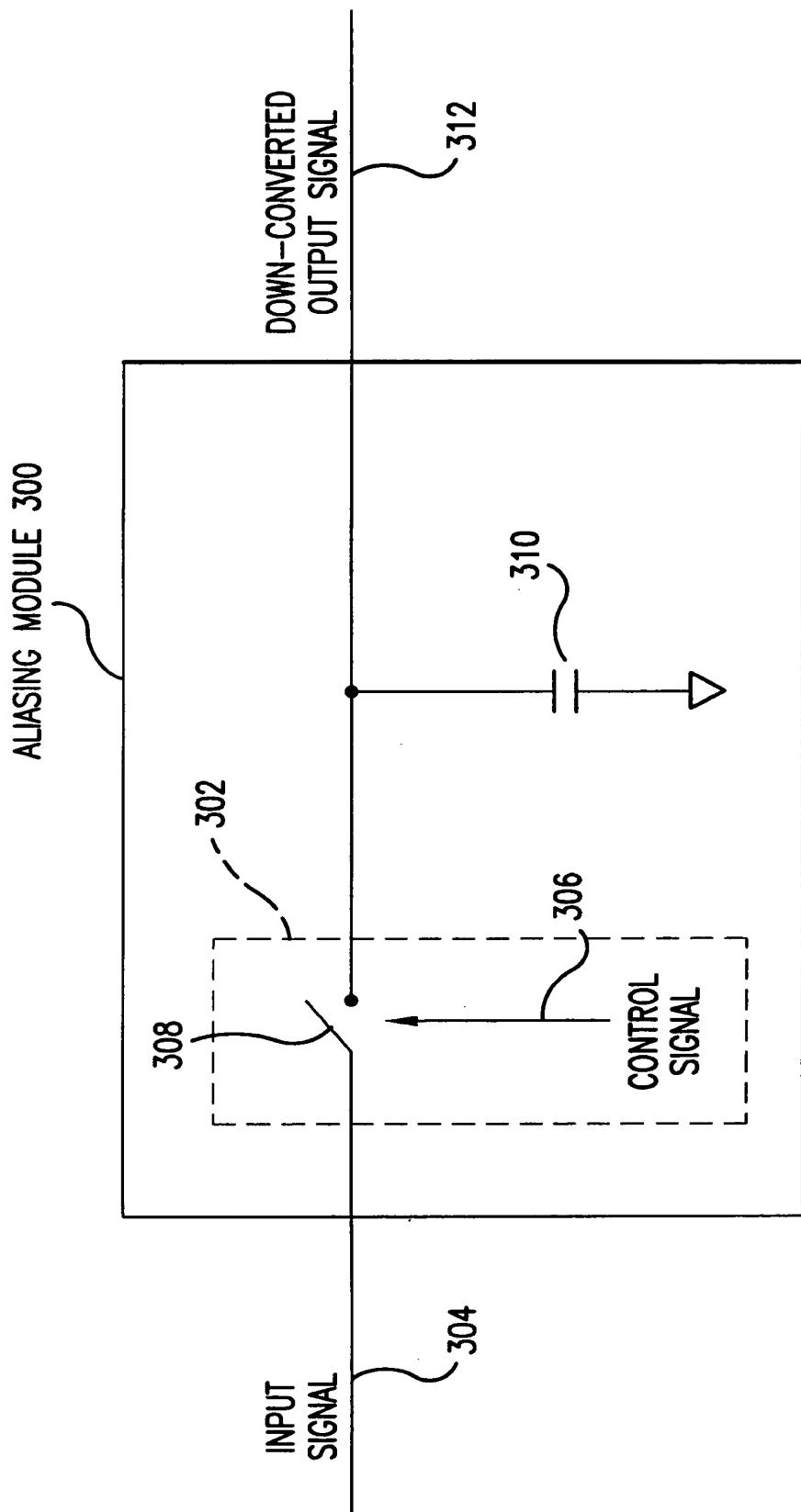


FIG.3A

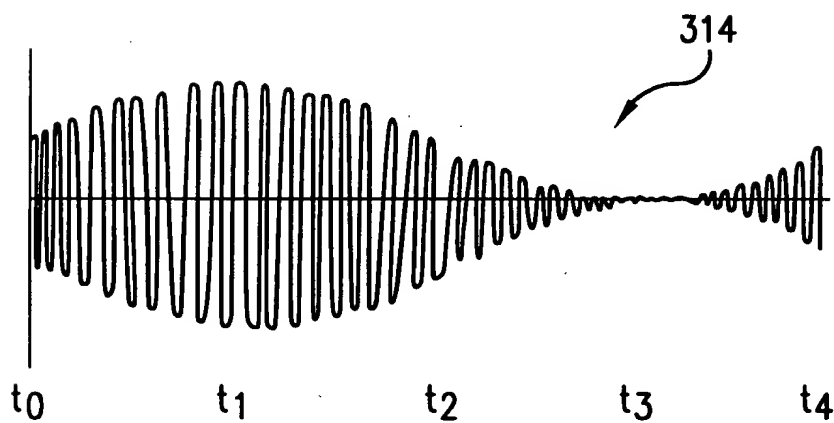


FIG. 3B

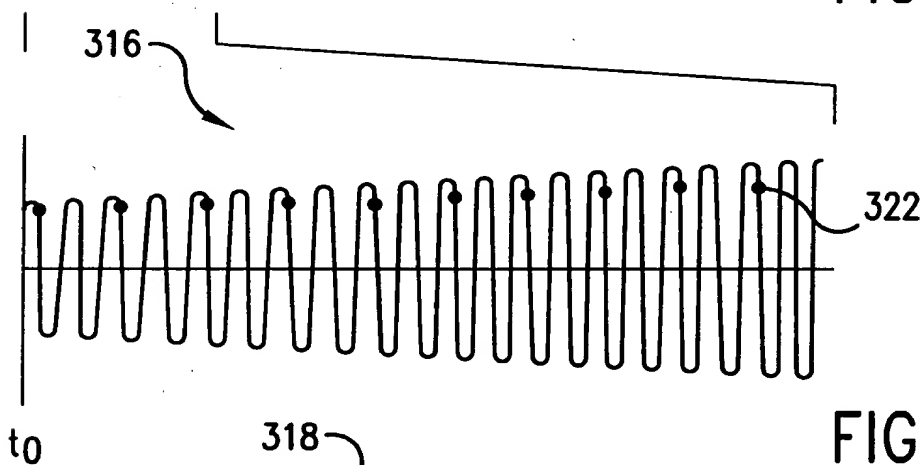


FIG. 3C

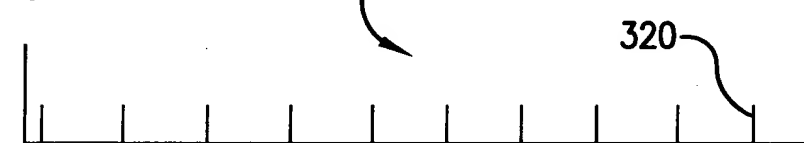


FIG. 3D

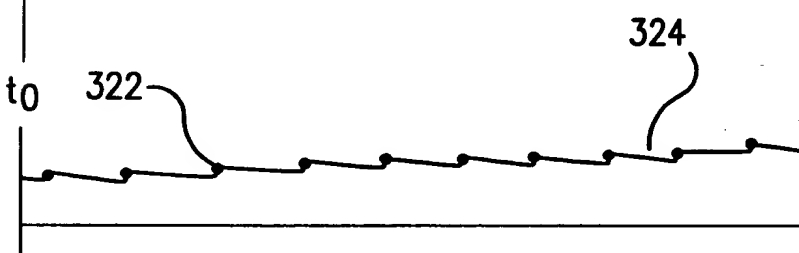


FIG. 3E

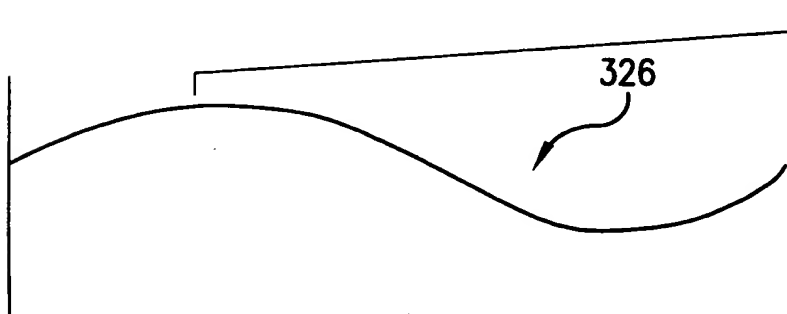


FIG. 3F

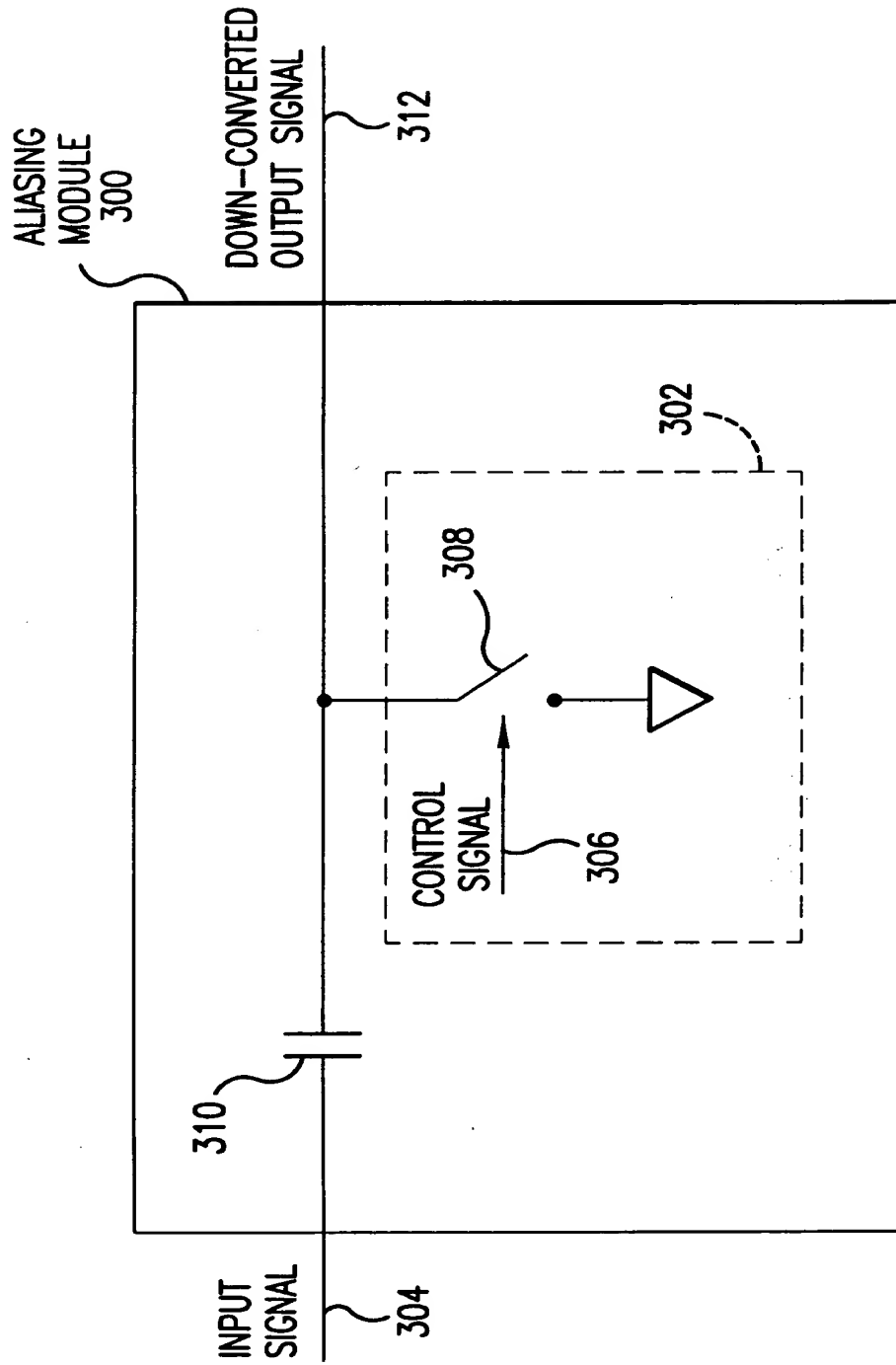


FIG.3G

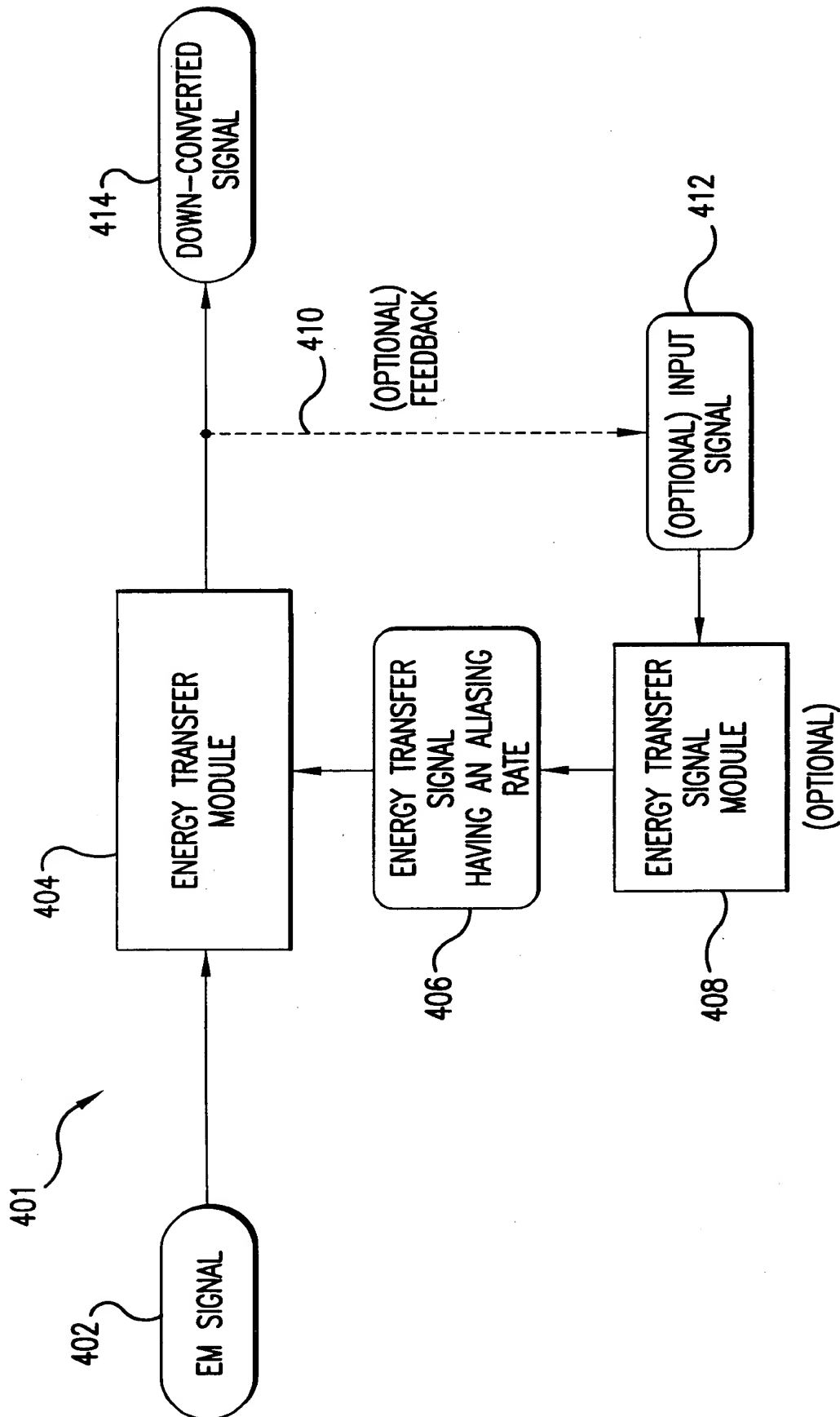
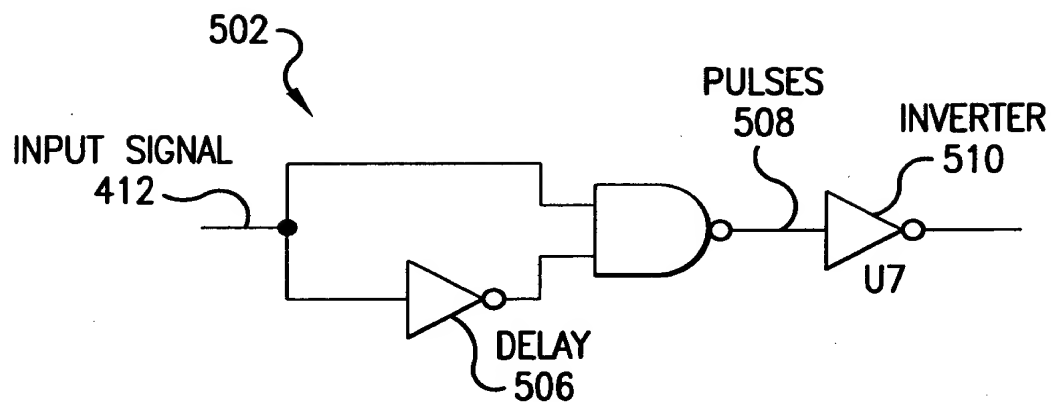


FIG. 4

**FIG.5**

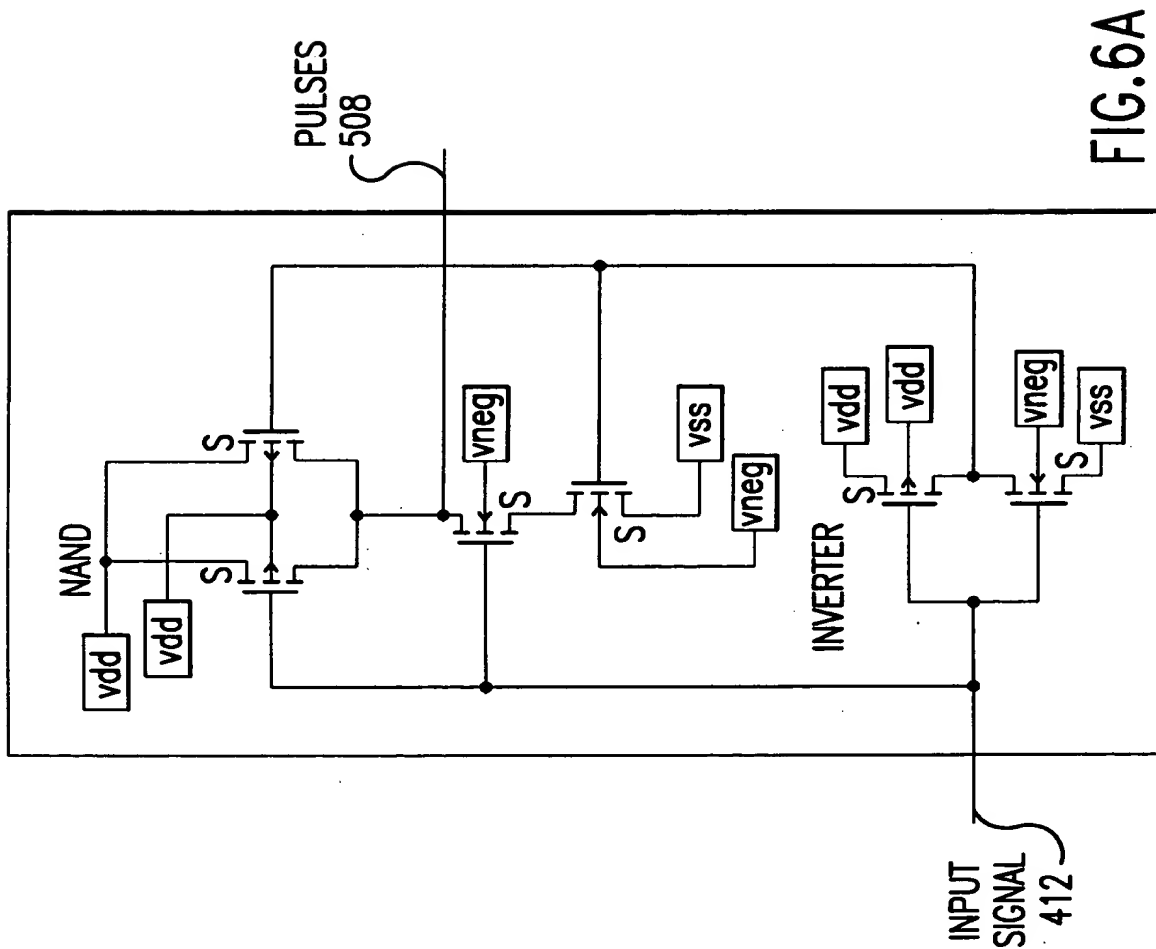


FIG. 6A

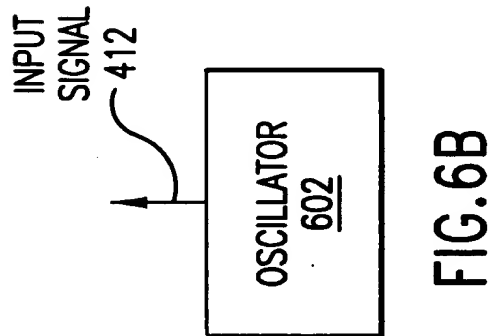


FIG. 6B

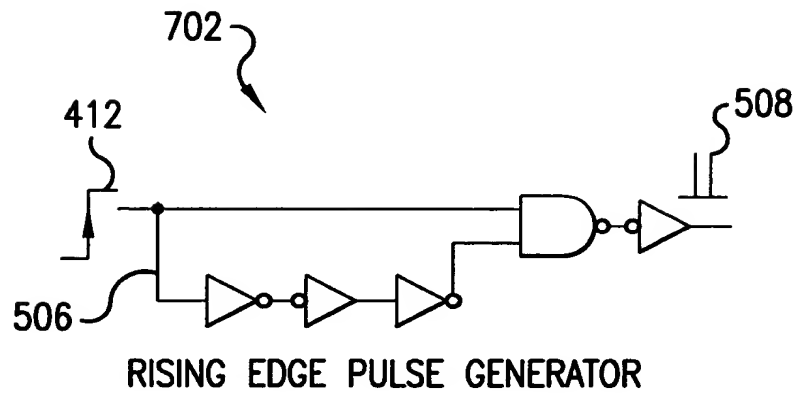


FIG.7A

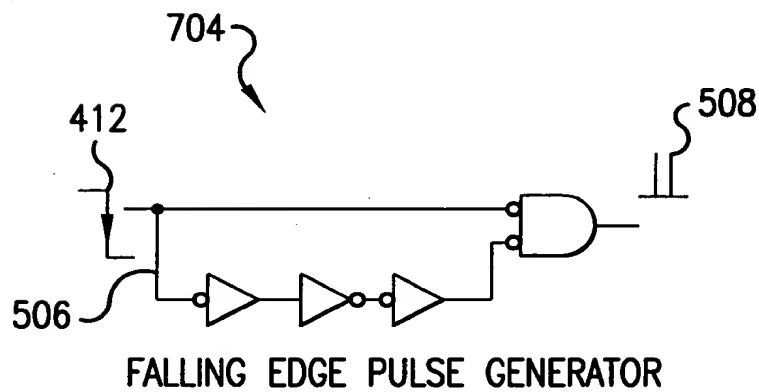


FIG.7B

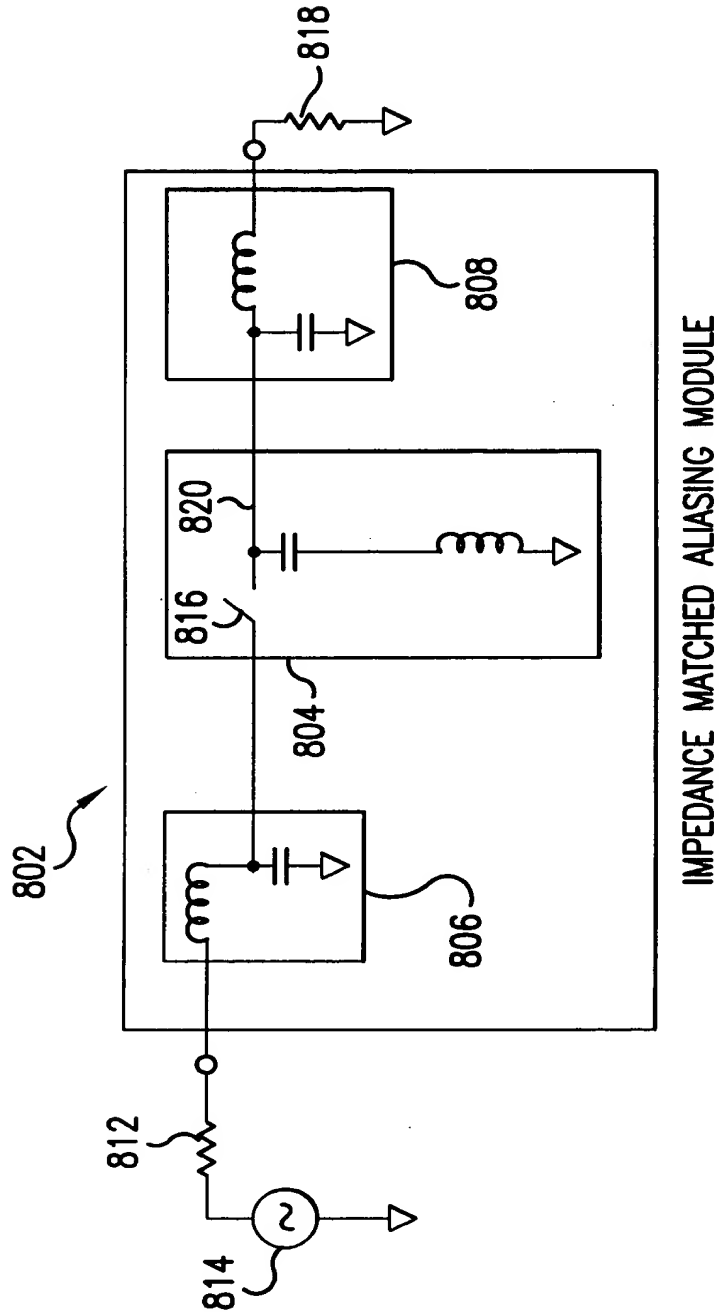
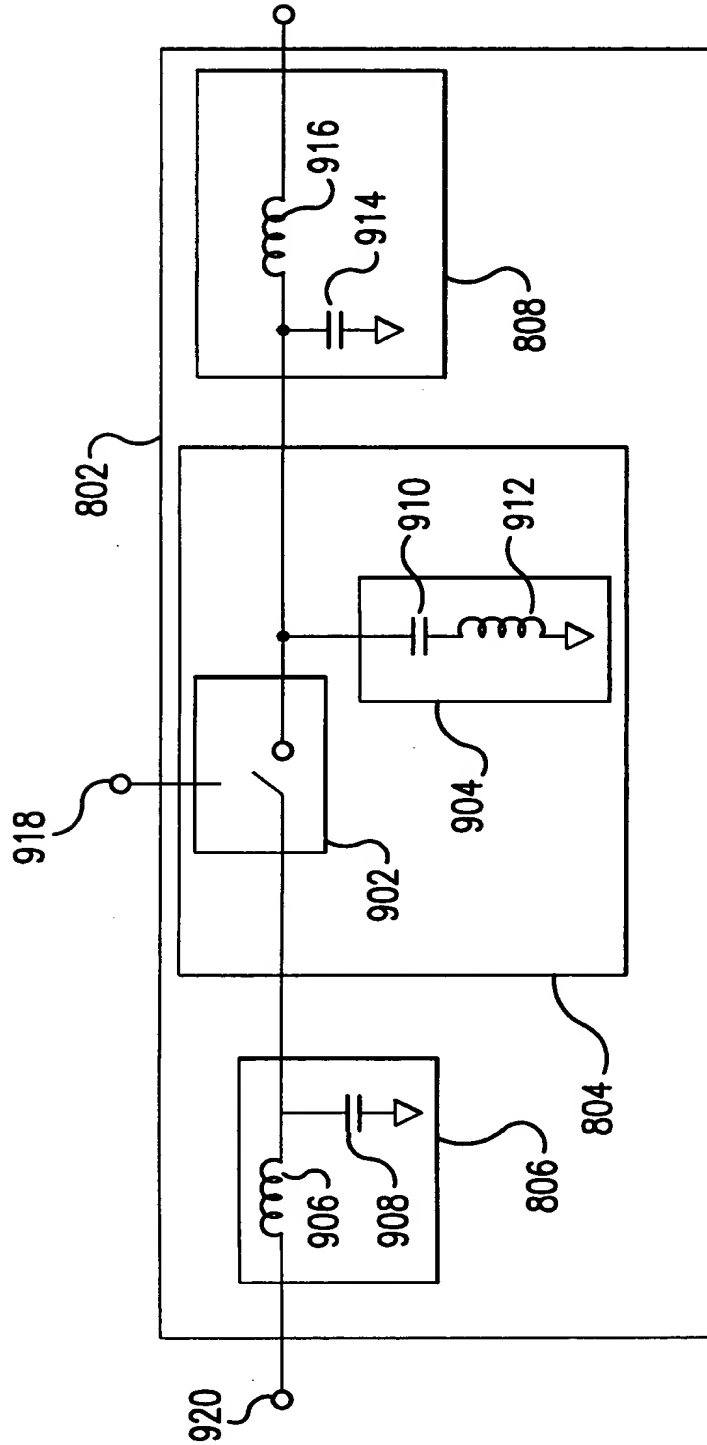


FIG.8



ALIASING MODULE

FIG. 9

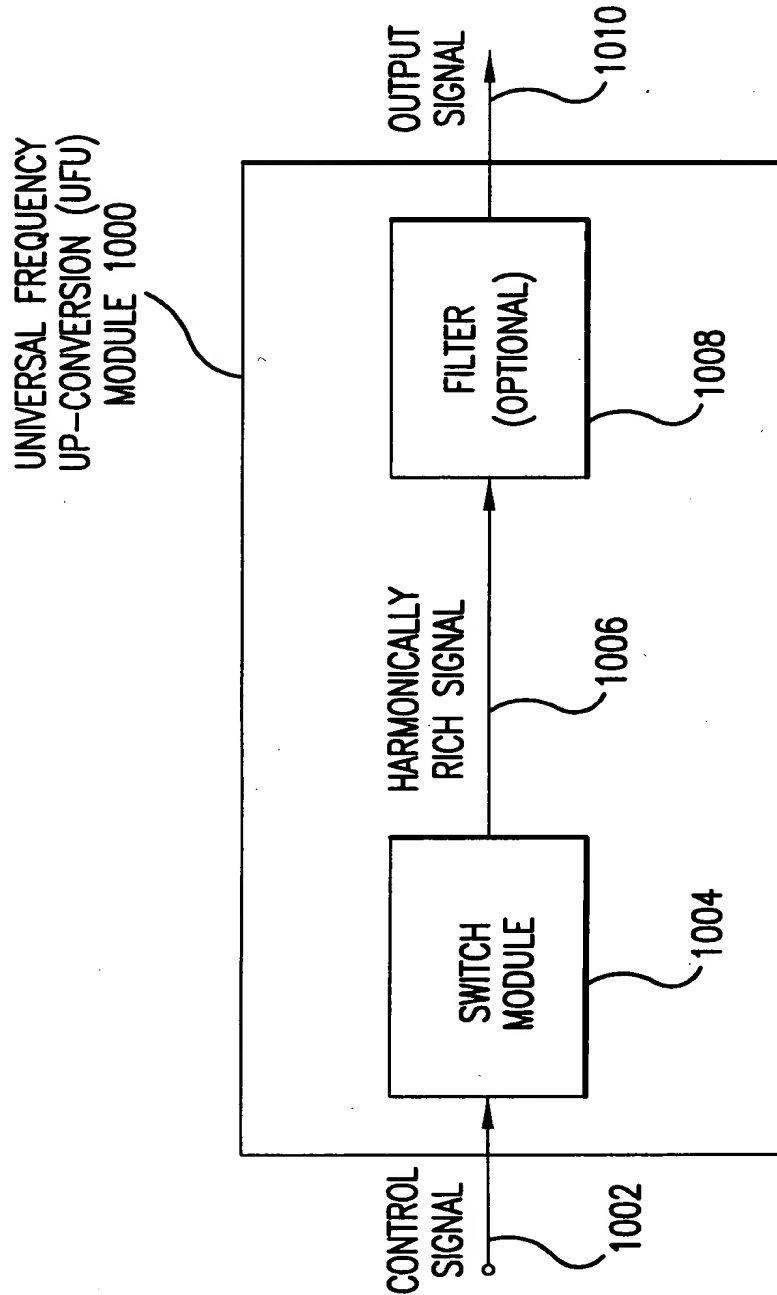


FIG.10

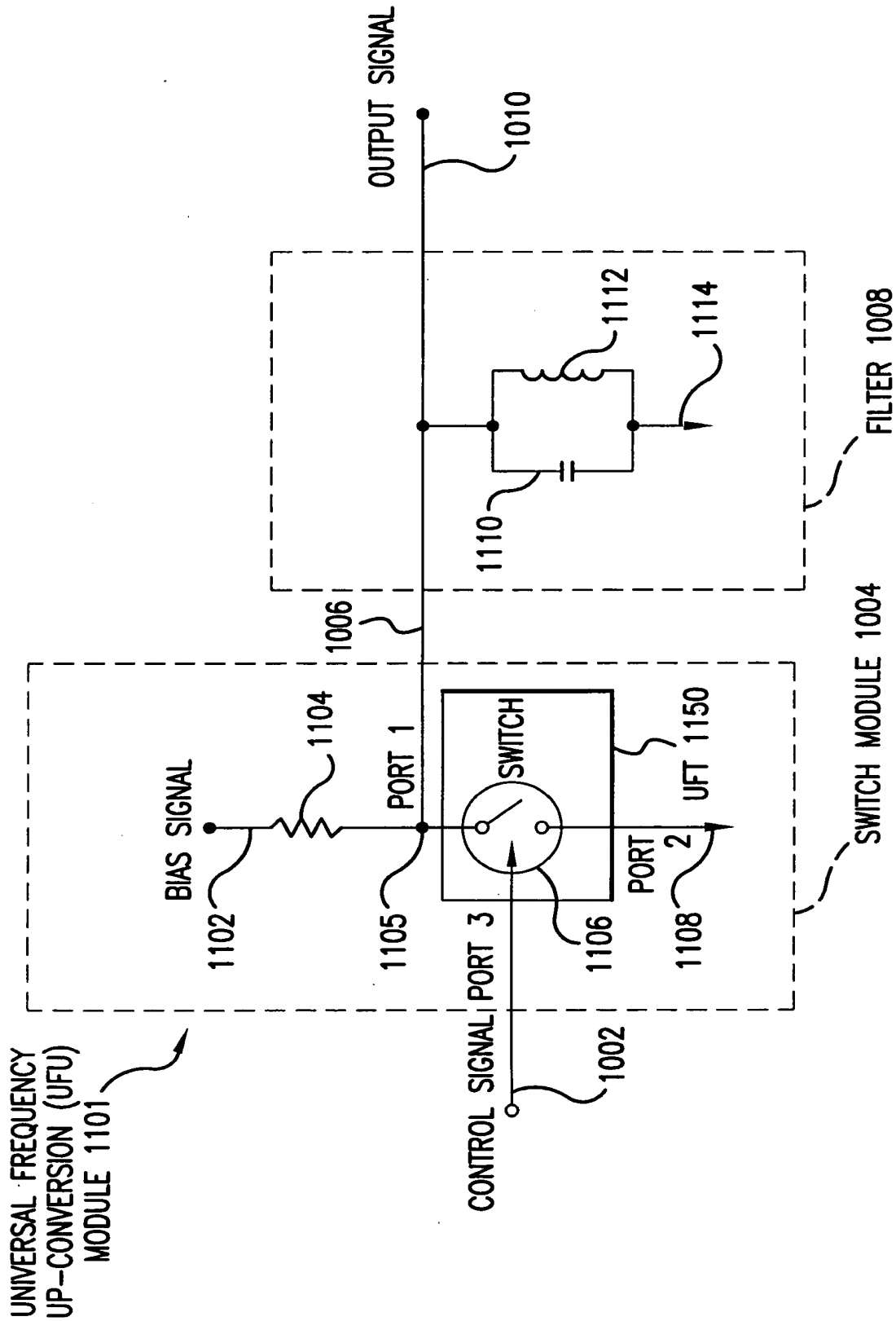


FIG.11

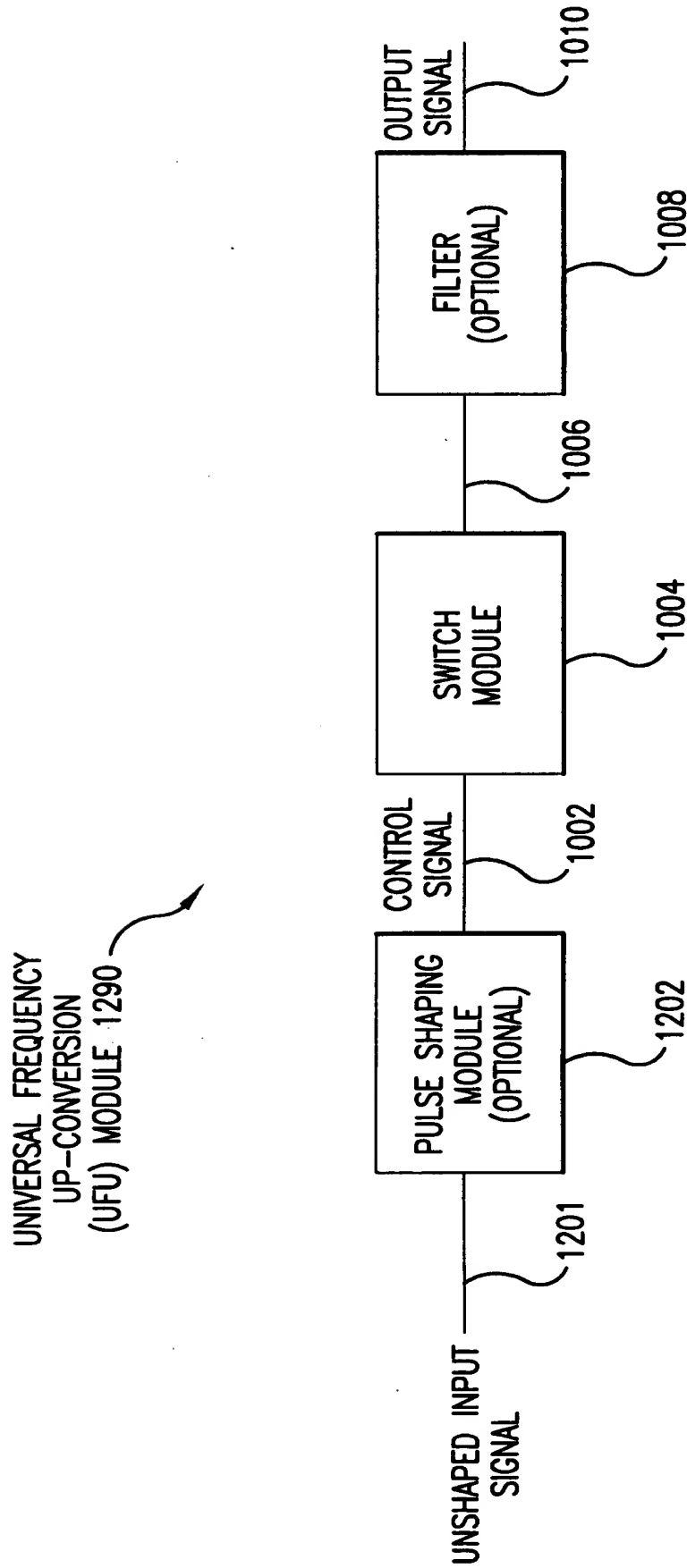
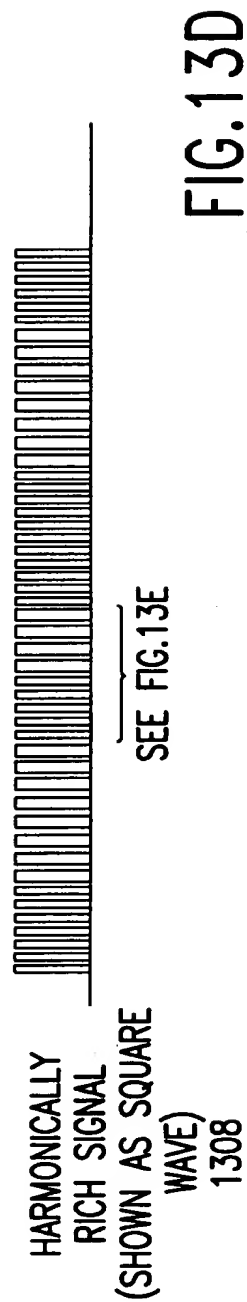
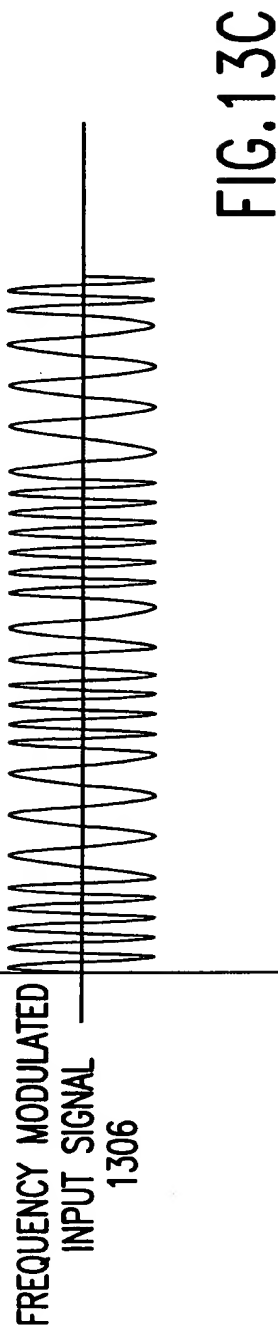
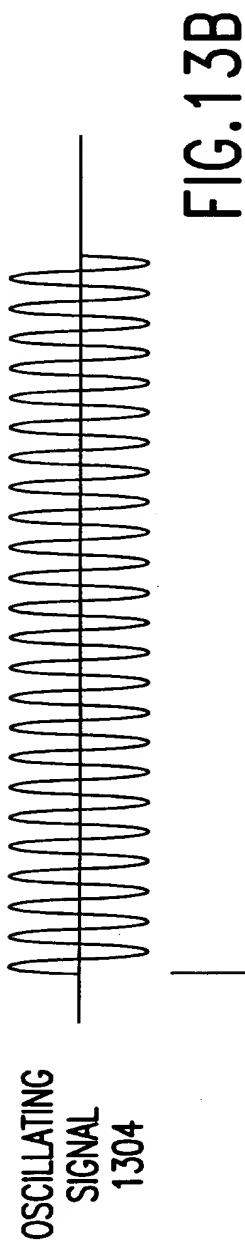
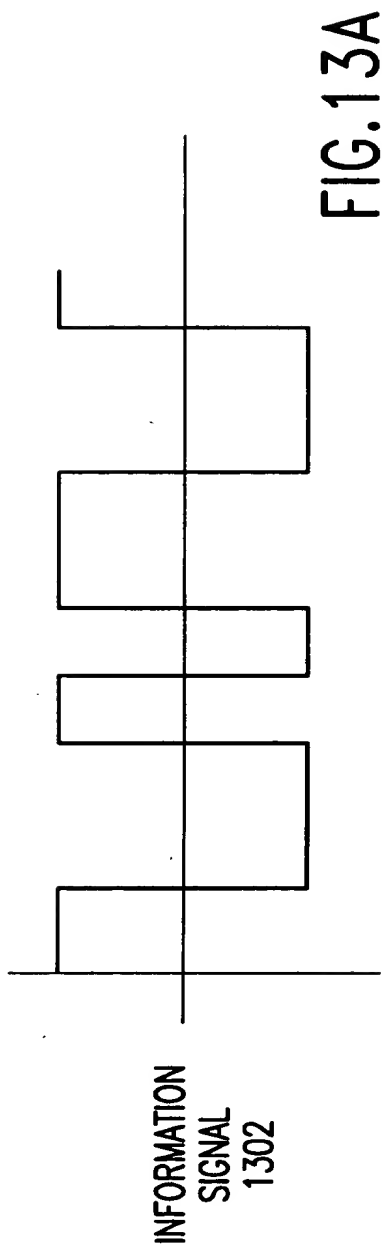
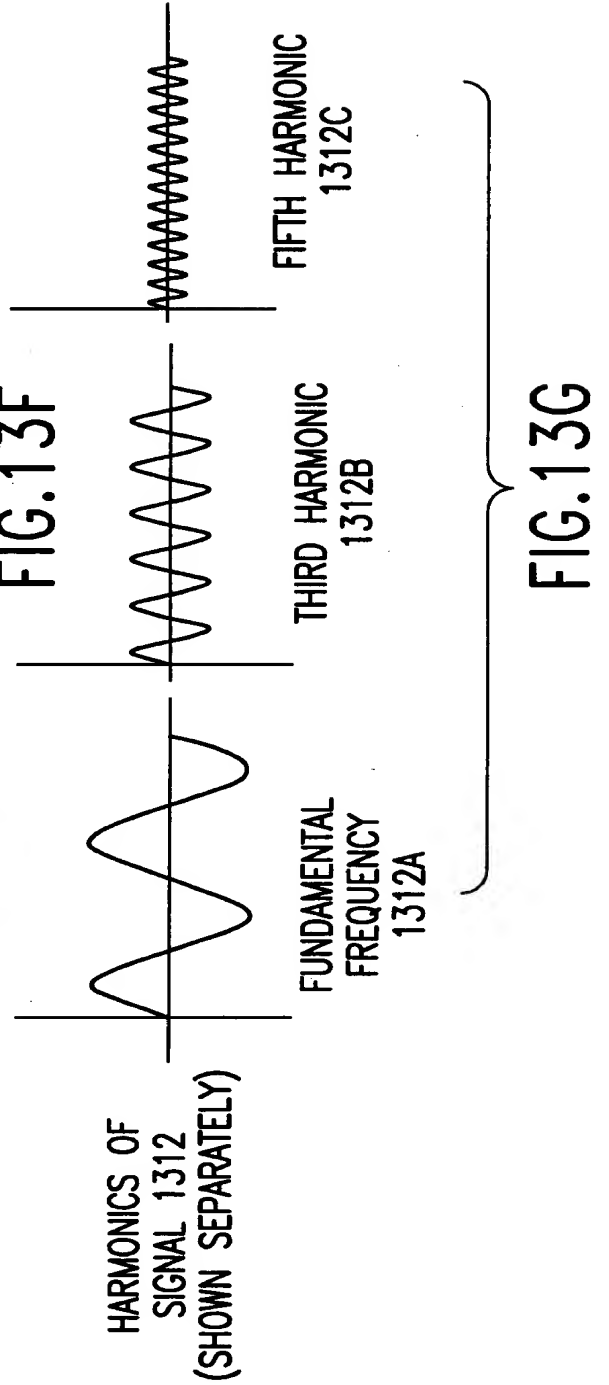
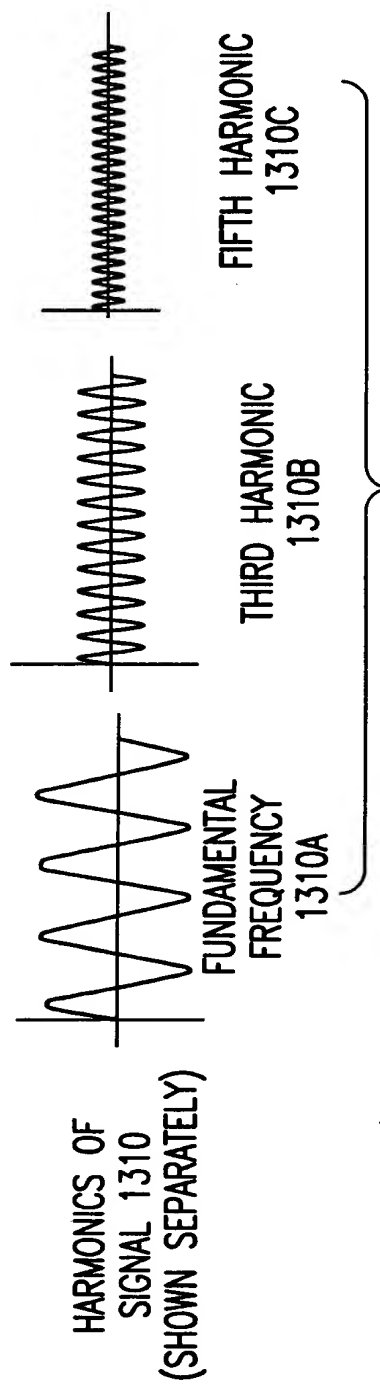
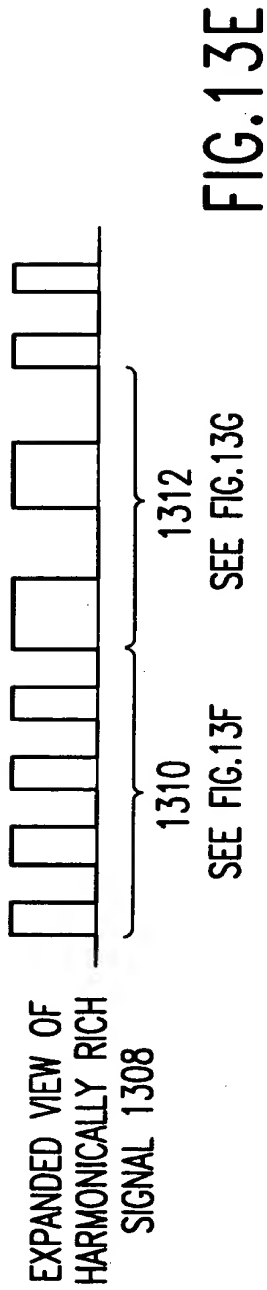


FIG.12





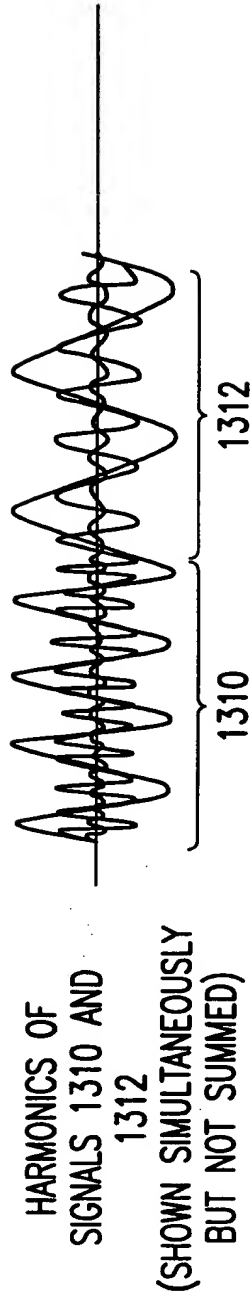


FIG. 13H

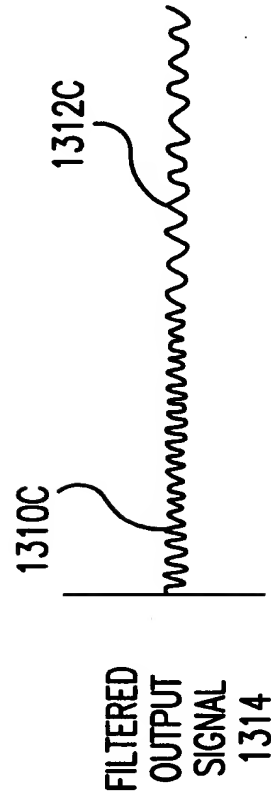


FIG. 13I

UNIFIED DOWNCONVERTING AND
 FILTERING (UDF) MODULE 1402

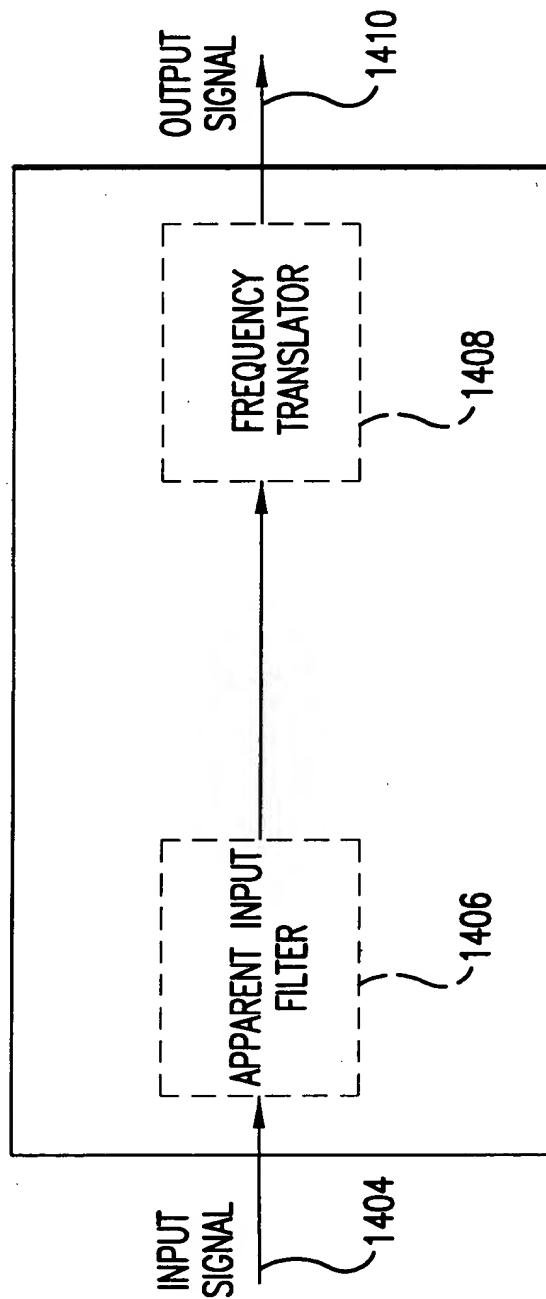


FIG.14

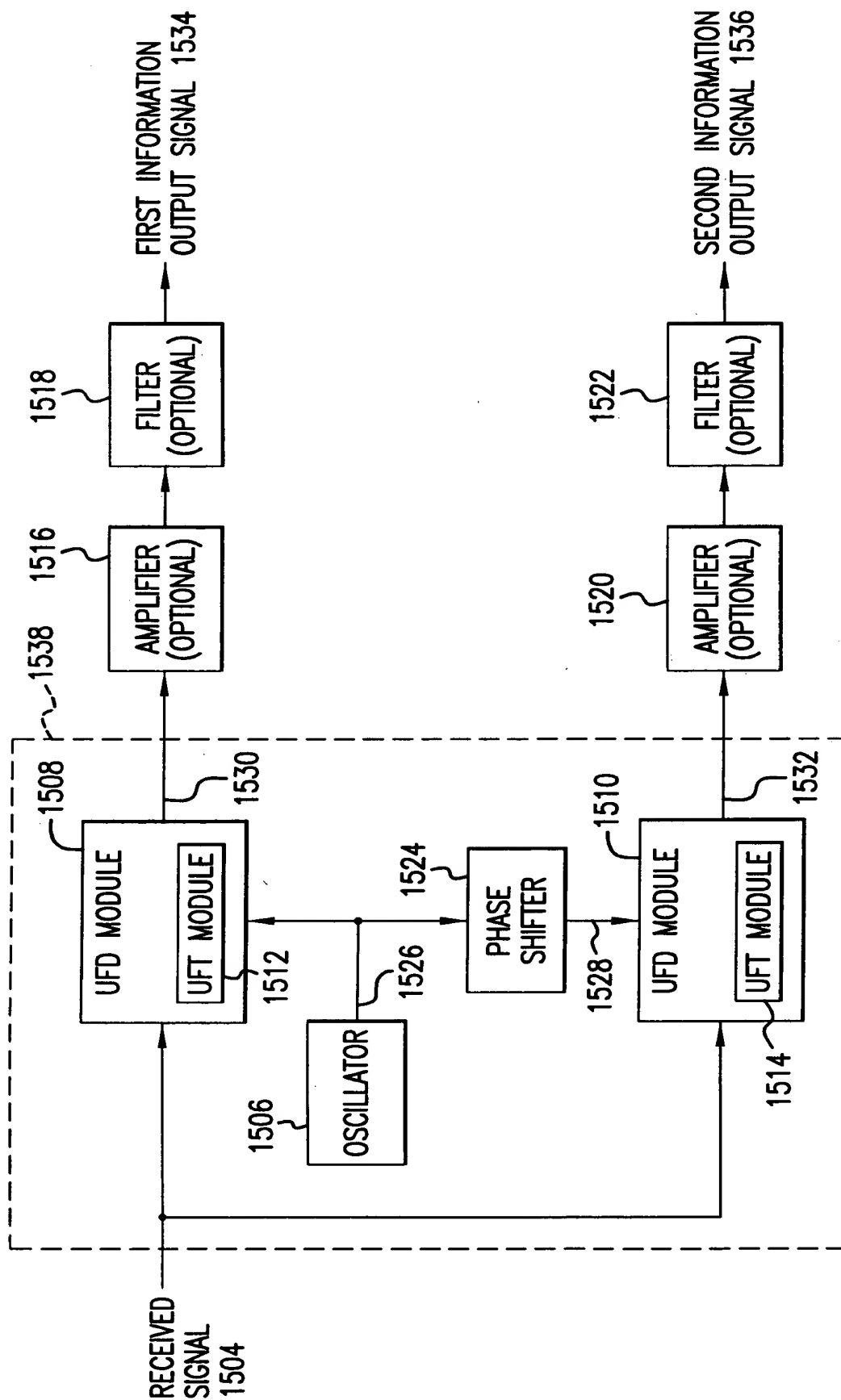
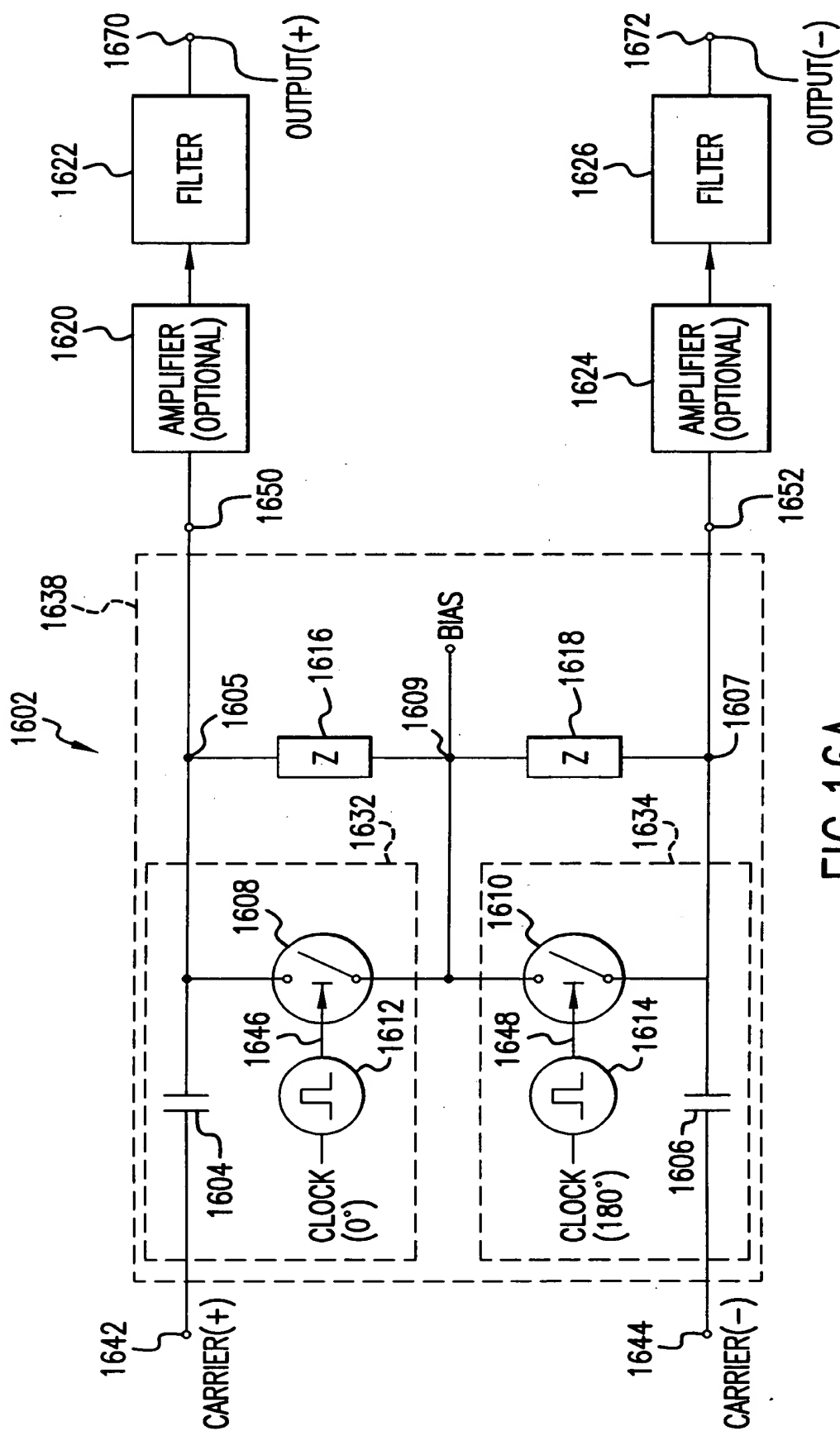


FIG. 15



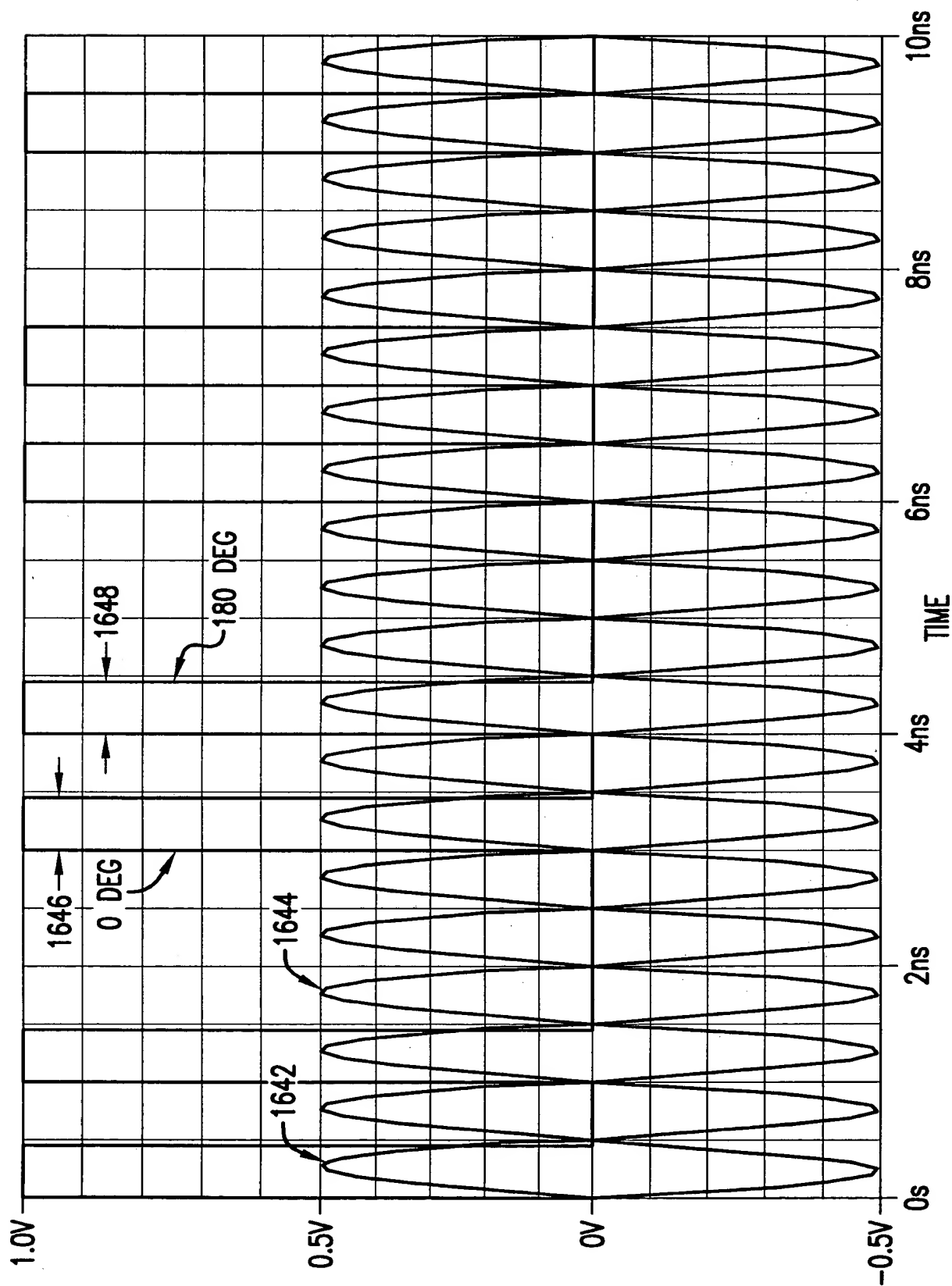


FIG. 16B

Appl. No. 09/855,851; Group Art Unit: 2681
Dkt. No. 1744.1260001; Batch No.: (to be assigned)
Inventor(s): Sorrells *et al.*; Tel: 202/371-2600
Title: Apparatus, System, and Method for Down-Converting
and Up-Converting Electromagnetic Signals

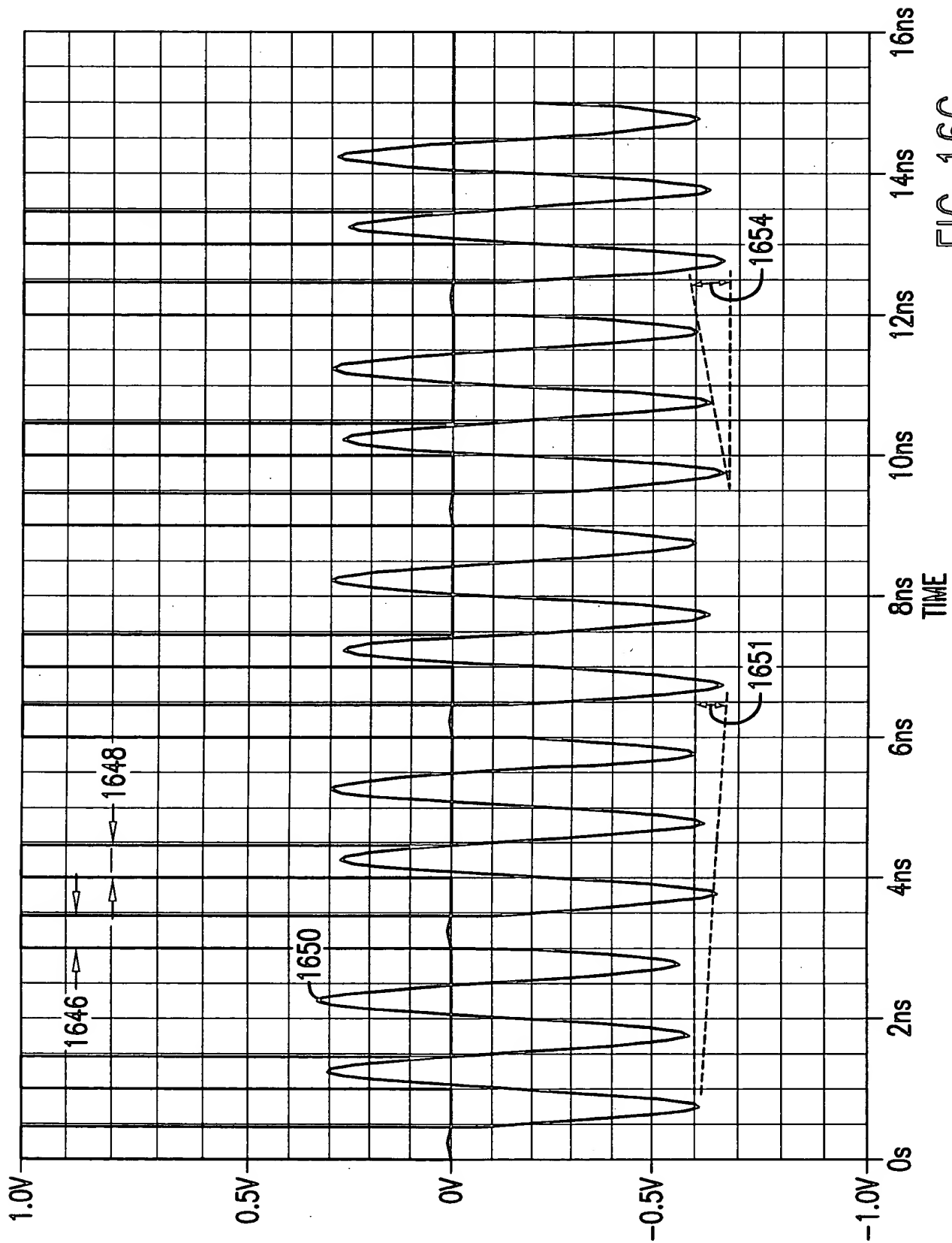


FIG. 16C

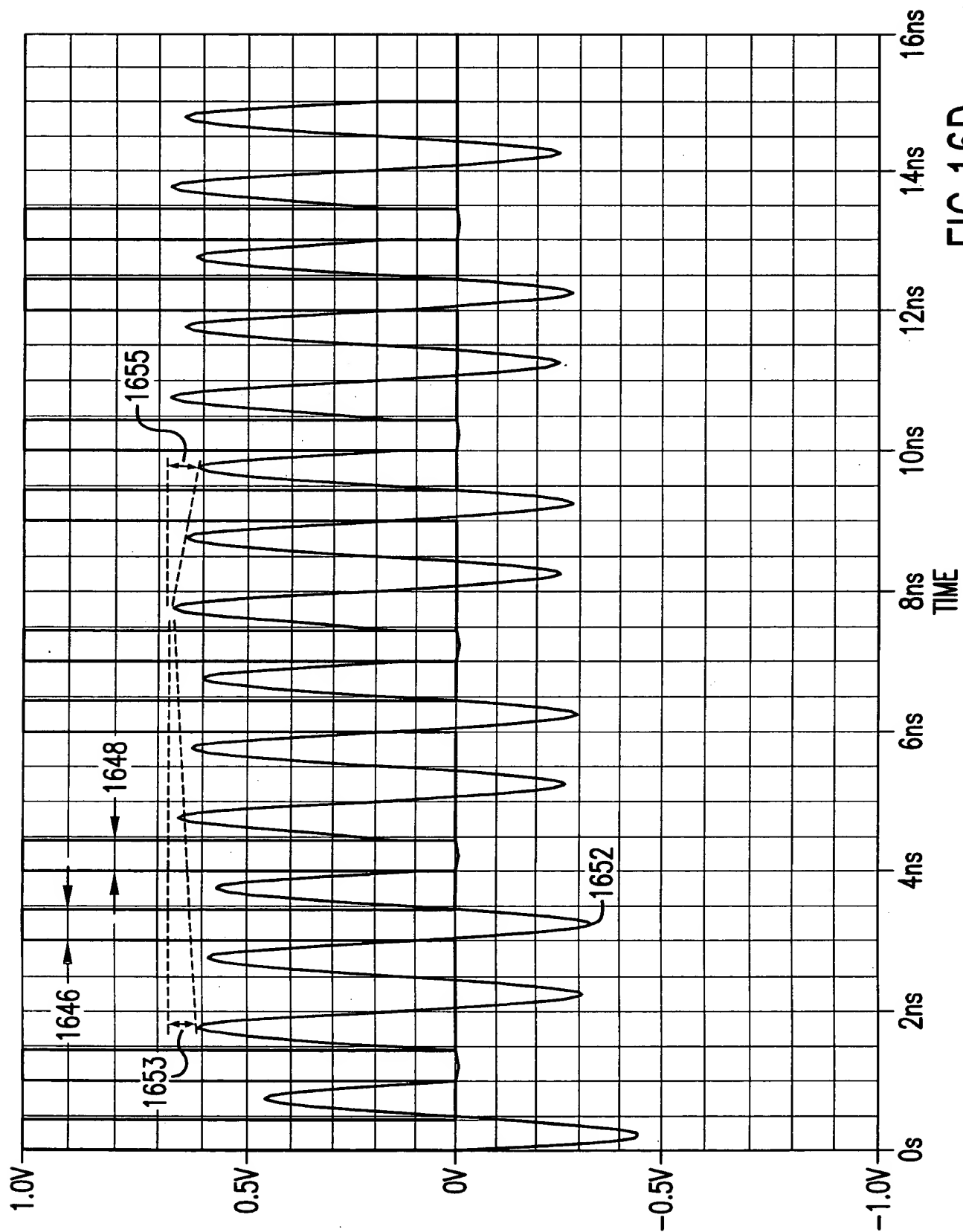


FIG.16D

Appl. No. 09/855,851; Group Art Unit: 2681
Dkt. No. 1744.1260001; Batch No.: (to be assigned)
Inventor(s): Sorrells *et al.*; Tel: 202/371-2600
Title: Apparatus, System, and Method for Down-Converting
and Up-Converting Electromagnetic Signals

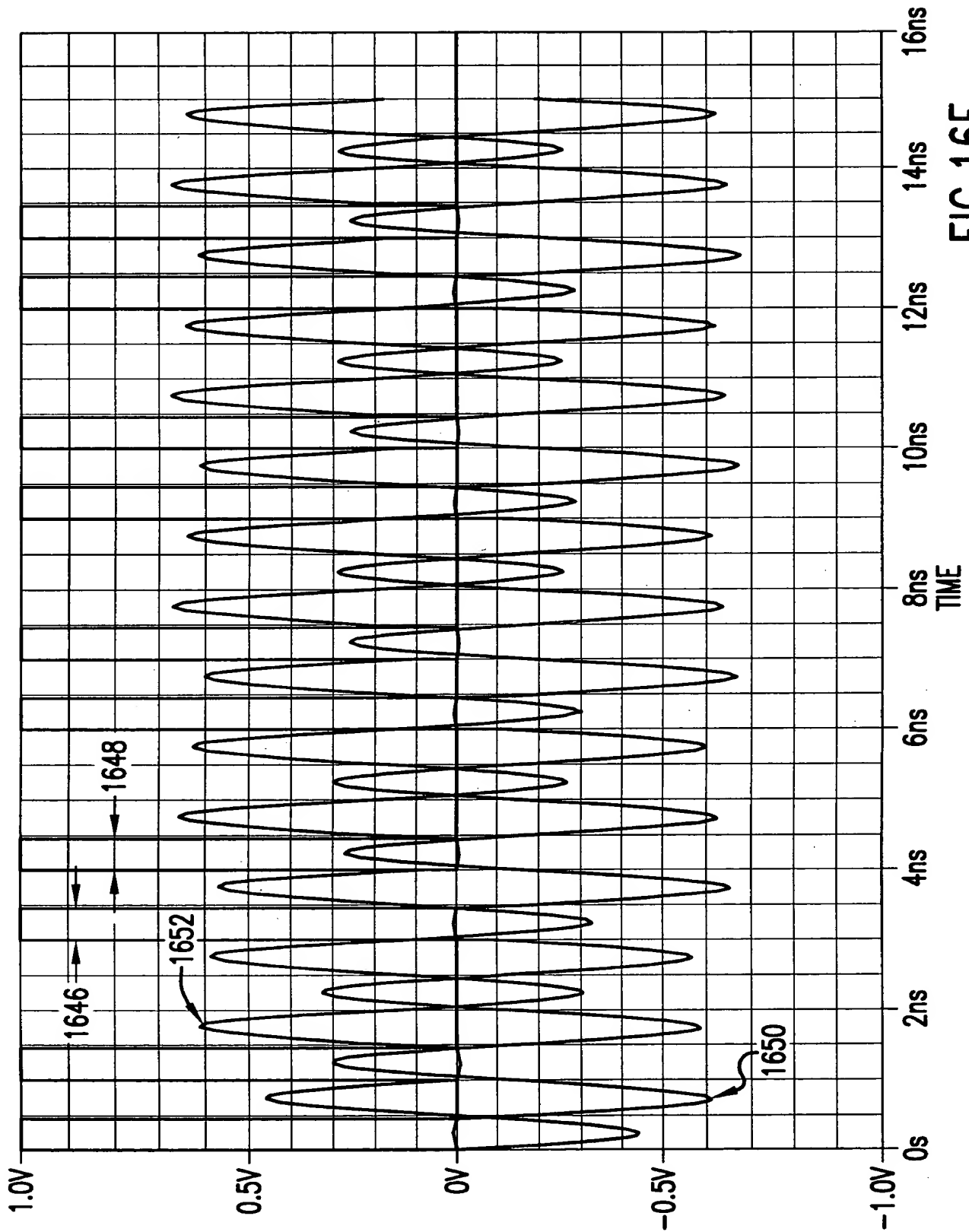


FIG.16E

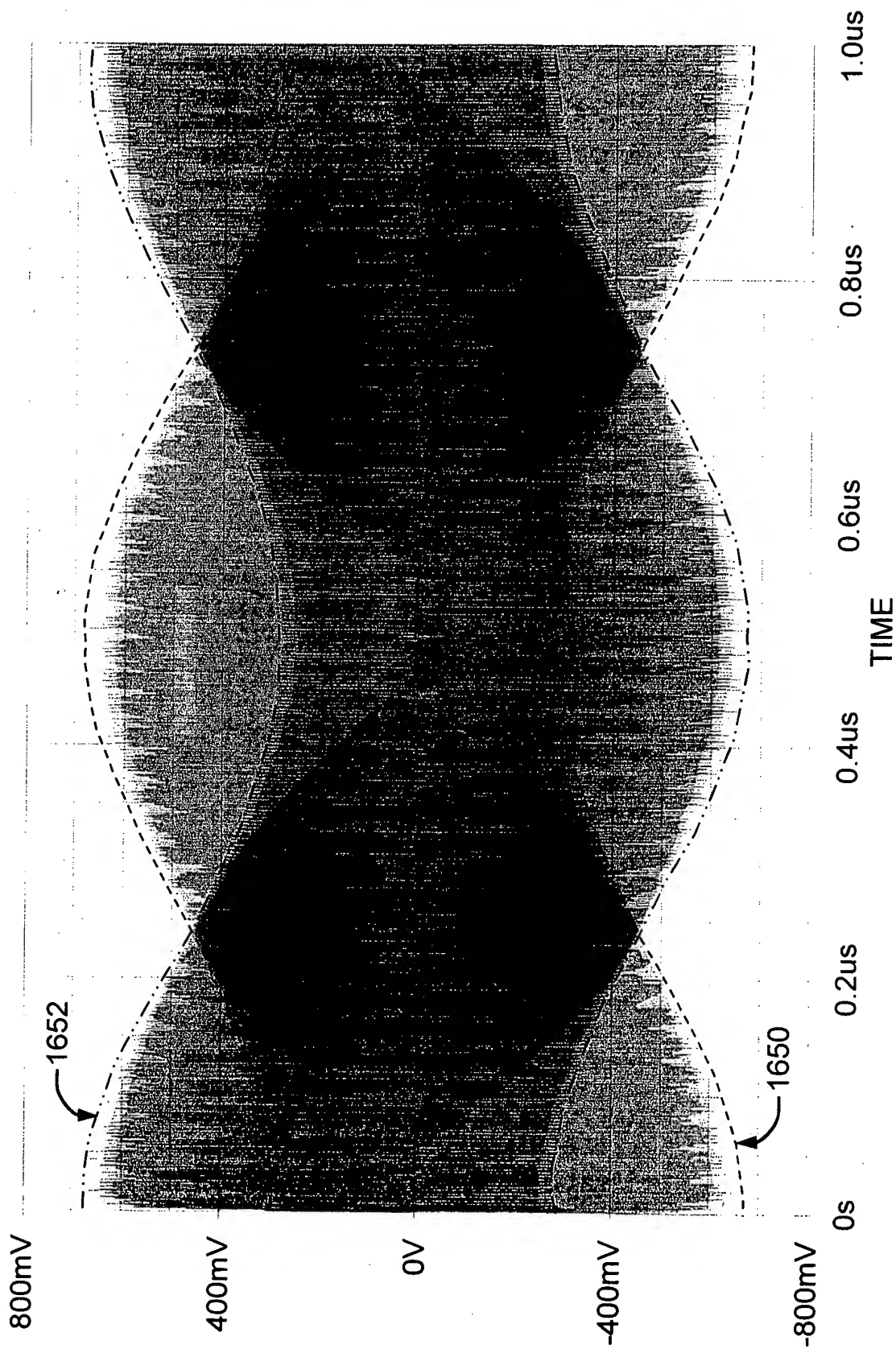
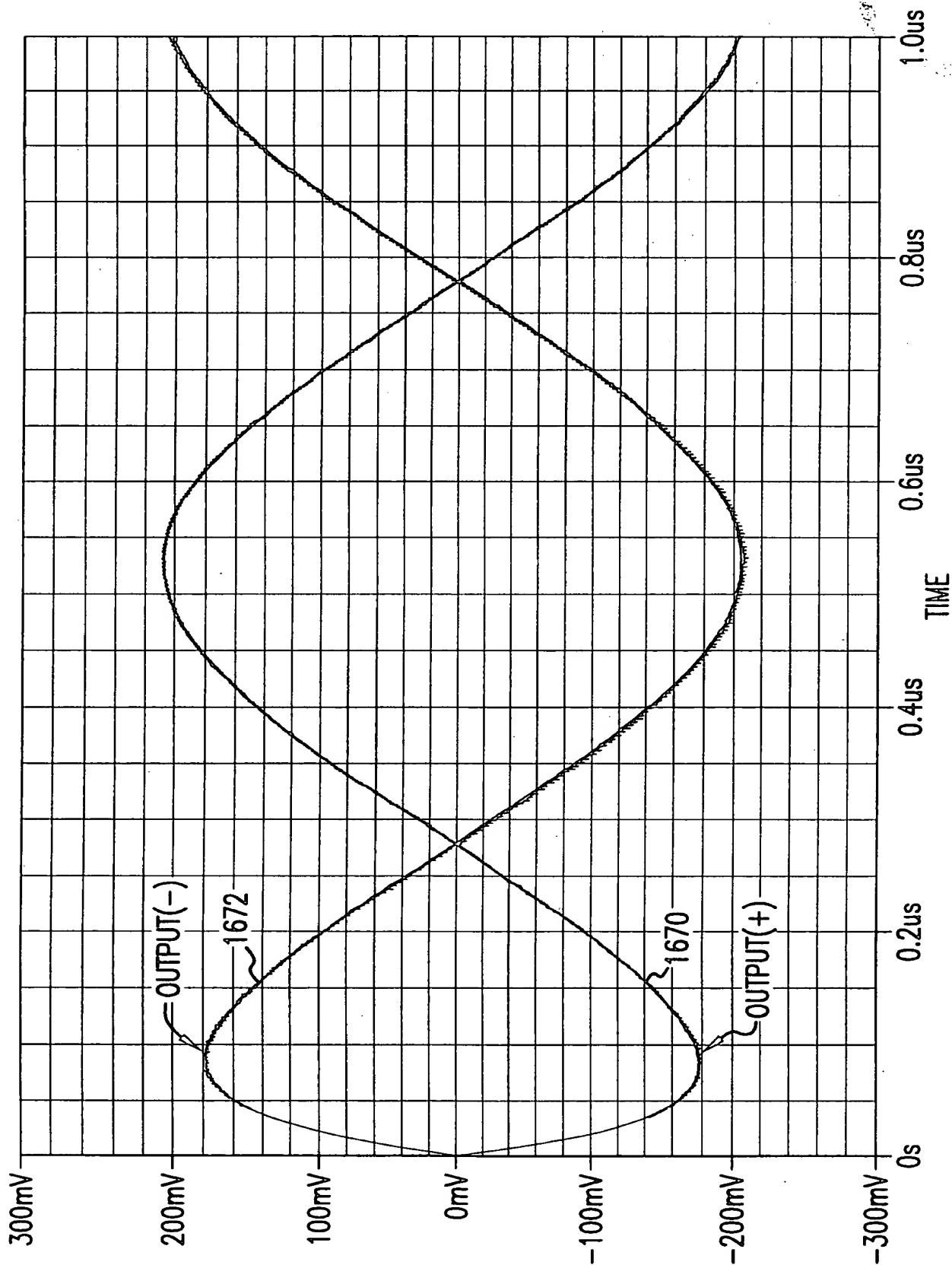


FIG.16F

Appl. No. 09/855,851; Group Art Unit: 2681
 Dkt. No. 1744.1260001; Batch No.: (to be assigned)
 Inventor(s): Sorrells *et al.*; Tel: 202/371-2600
 Title: Apparatus, System, and Method for Down-Converting
 and Up-Converting Electromagnetic Signals



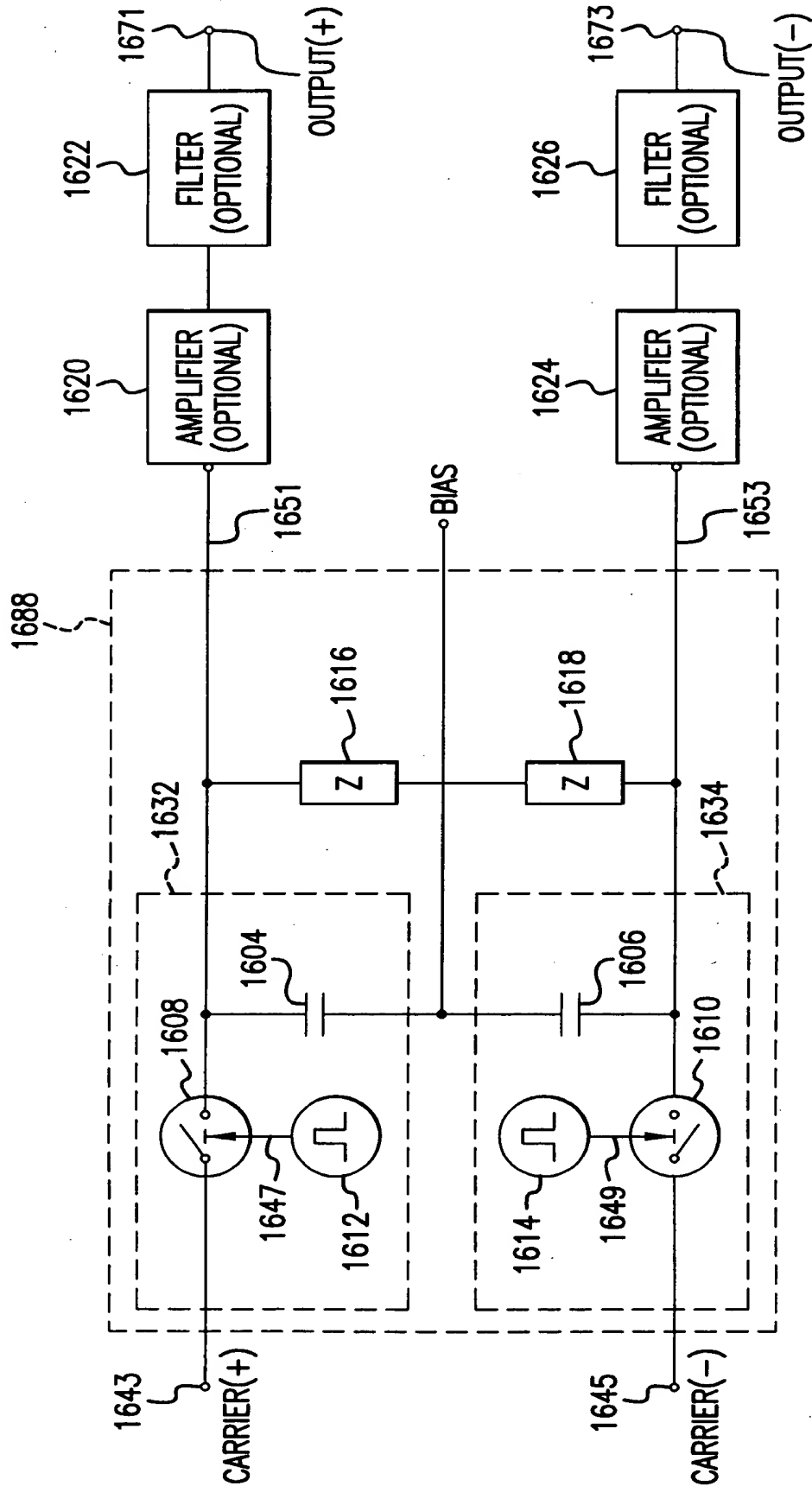


FIG. 16H

Appl. No. 09/855,851; Group Art Unit: 2681
Dkt. No. 1744.1260001; Batch No.: (to be assigned)
Inventor(s): Sorrells *et al.*; Tel: 202/371-2600
Title: Apparatus, System, and Method for Down-Converting
and Up-Converting Electromagnetic Signals

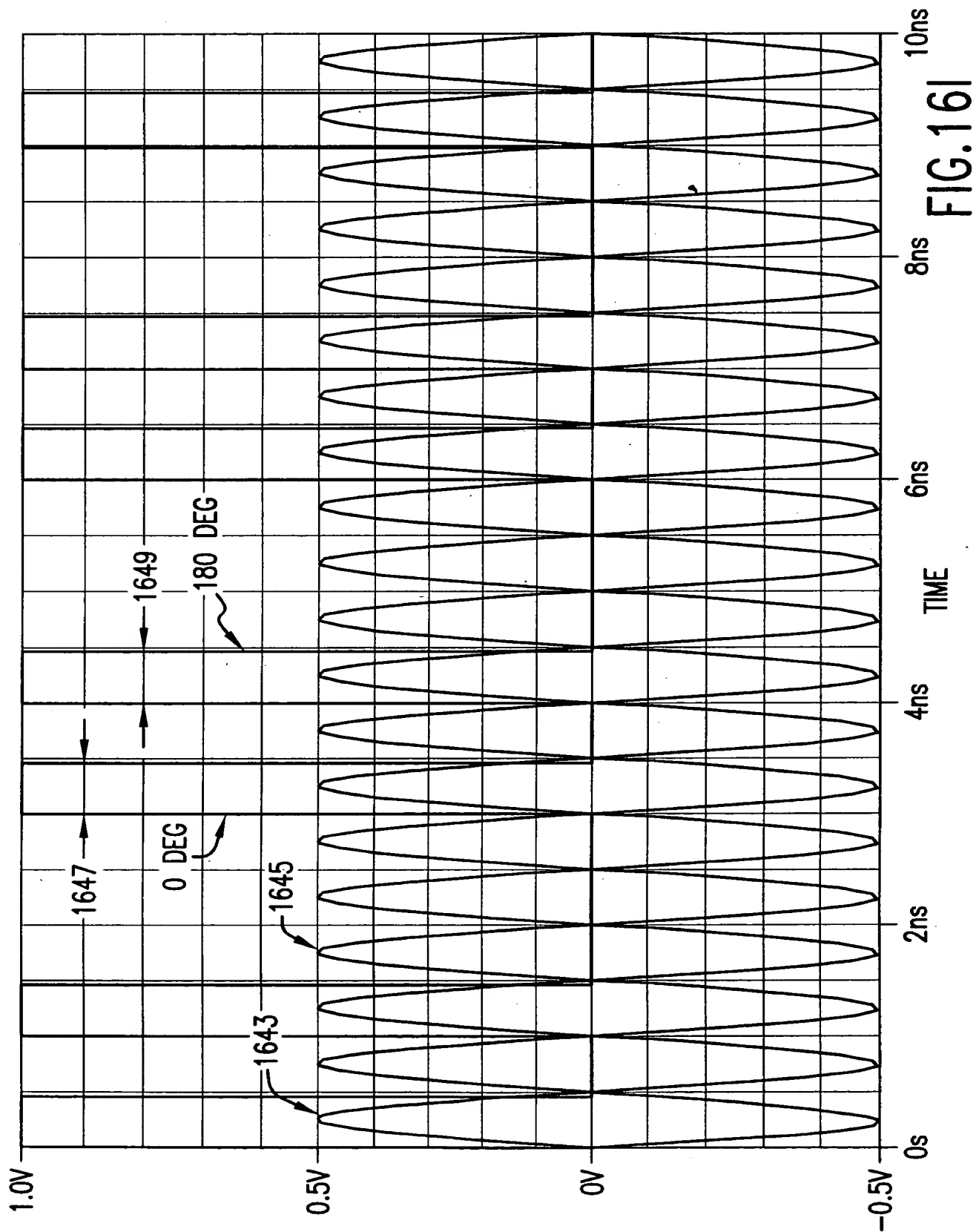


FIG. 16I

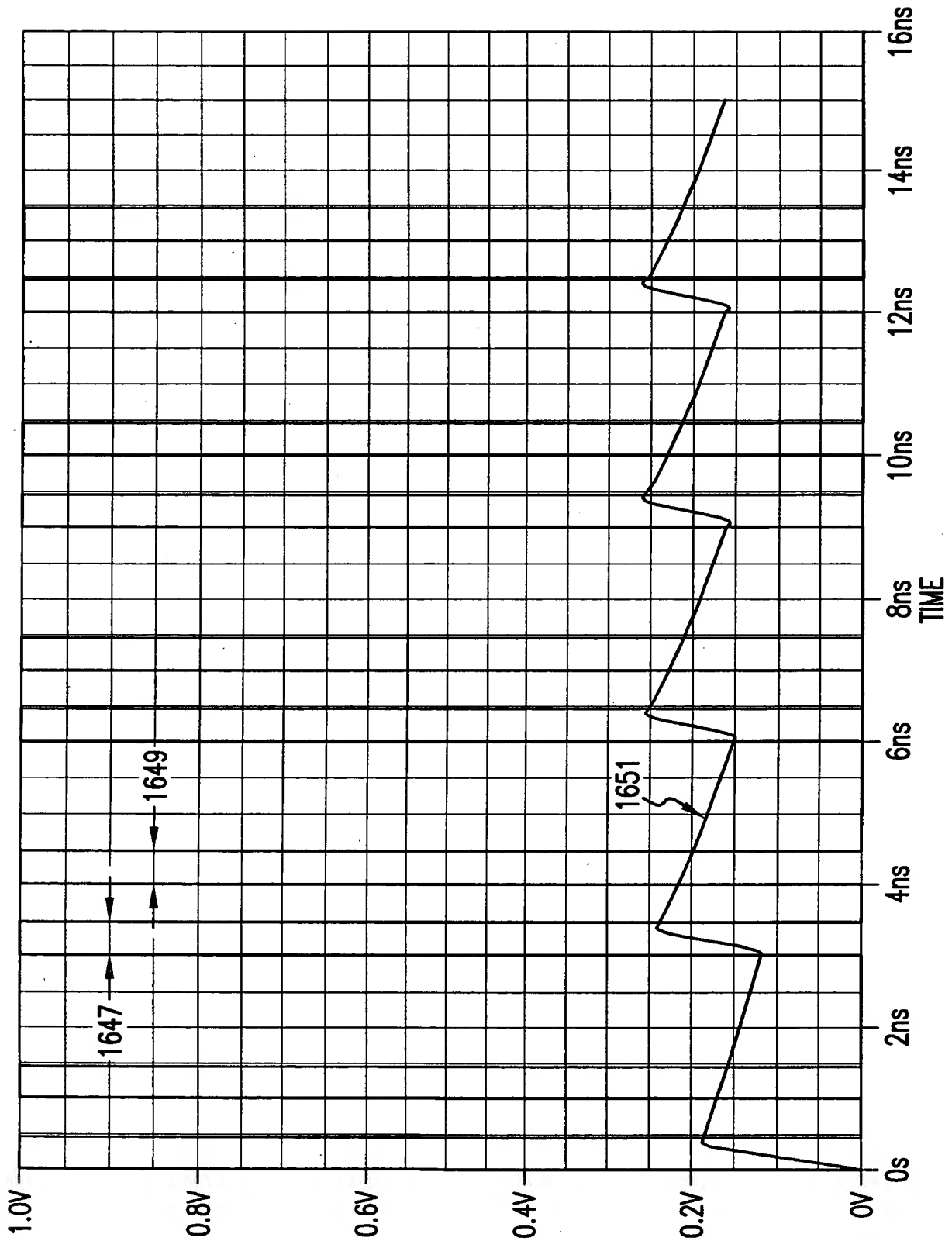


FIG. 16J

Appl. No. 09/855,851; Group Art Unit: 2681
Dkt. No. 1744.1260001; Batch No.: (to be assigned)
Inventor(s): Sorrells *et al.*; Tel: 202/371-2600
Title: Apparatus, System, and Method for Down-Converting
and Up-Converting Electromagnetic Signals

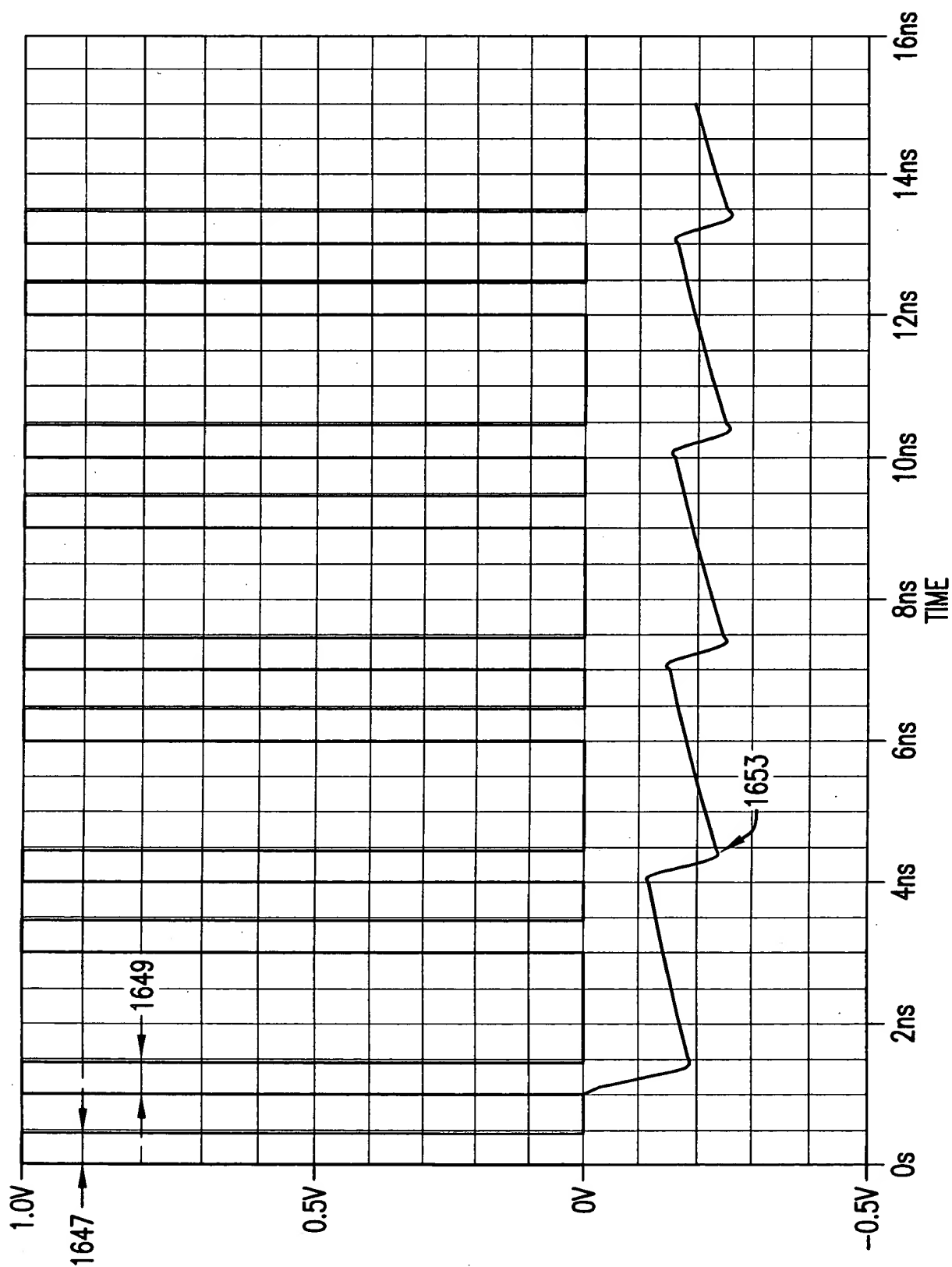


FIG. 16K

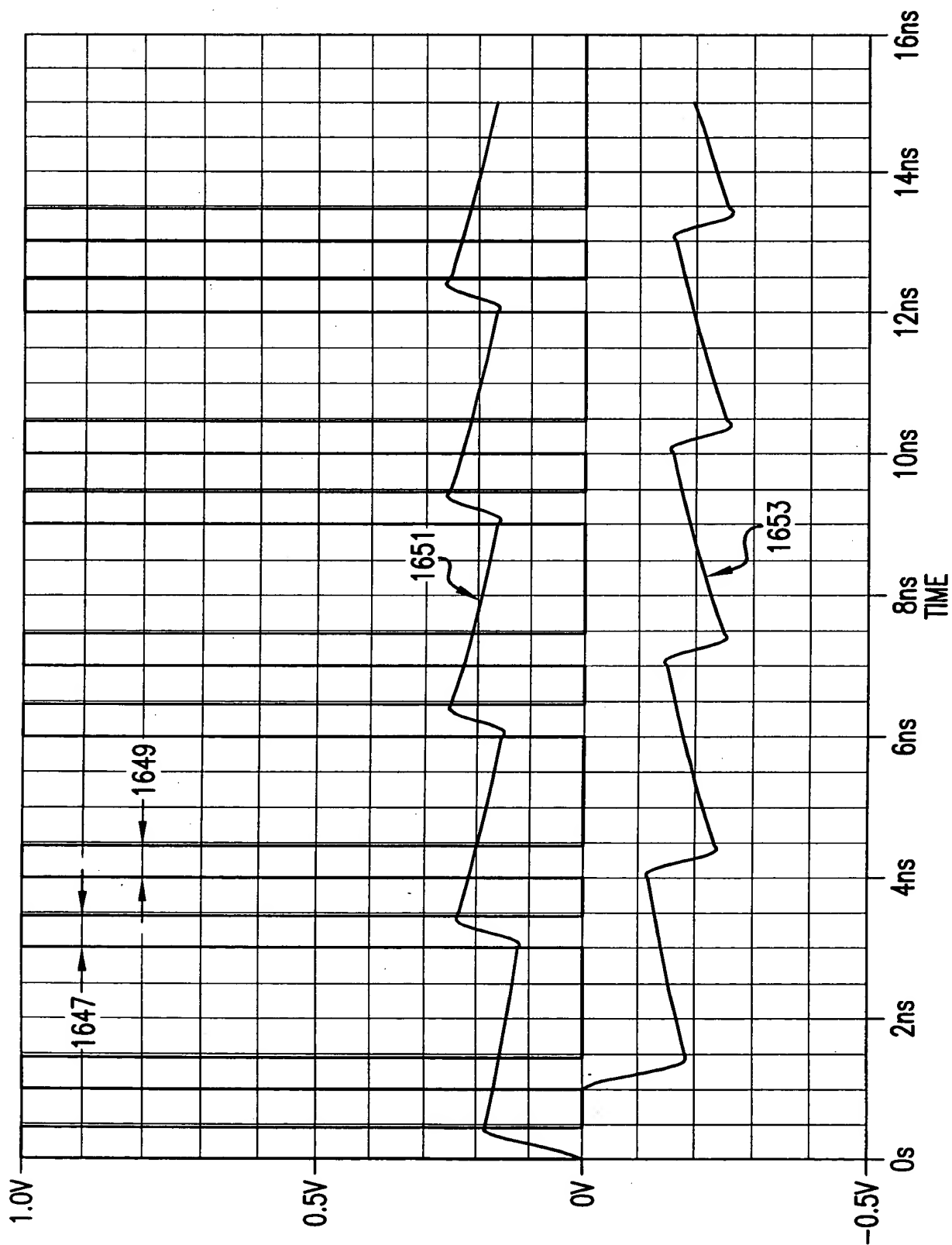


FIG. 16L

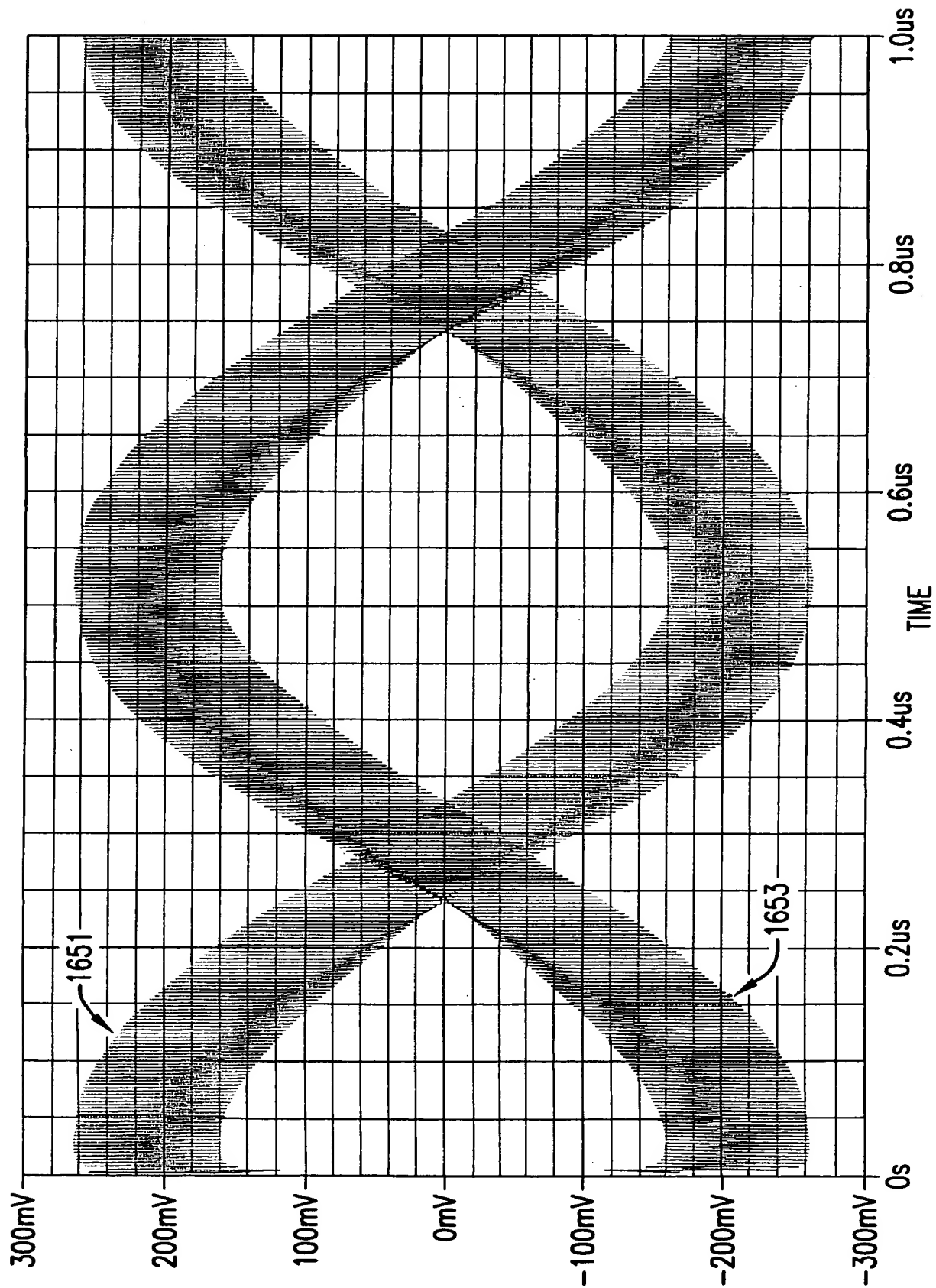


FIG. 16M

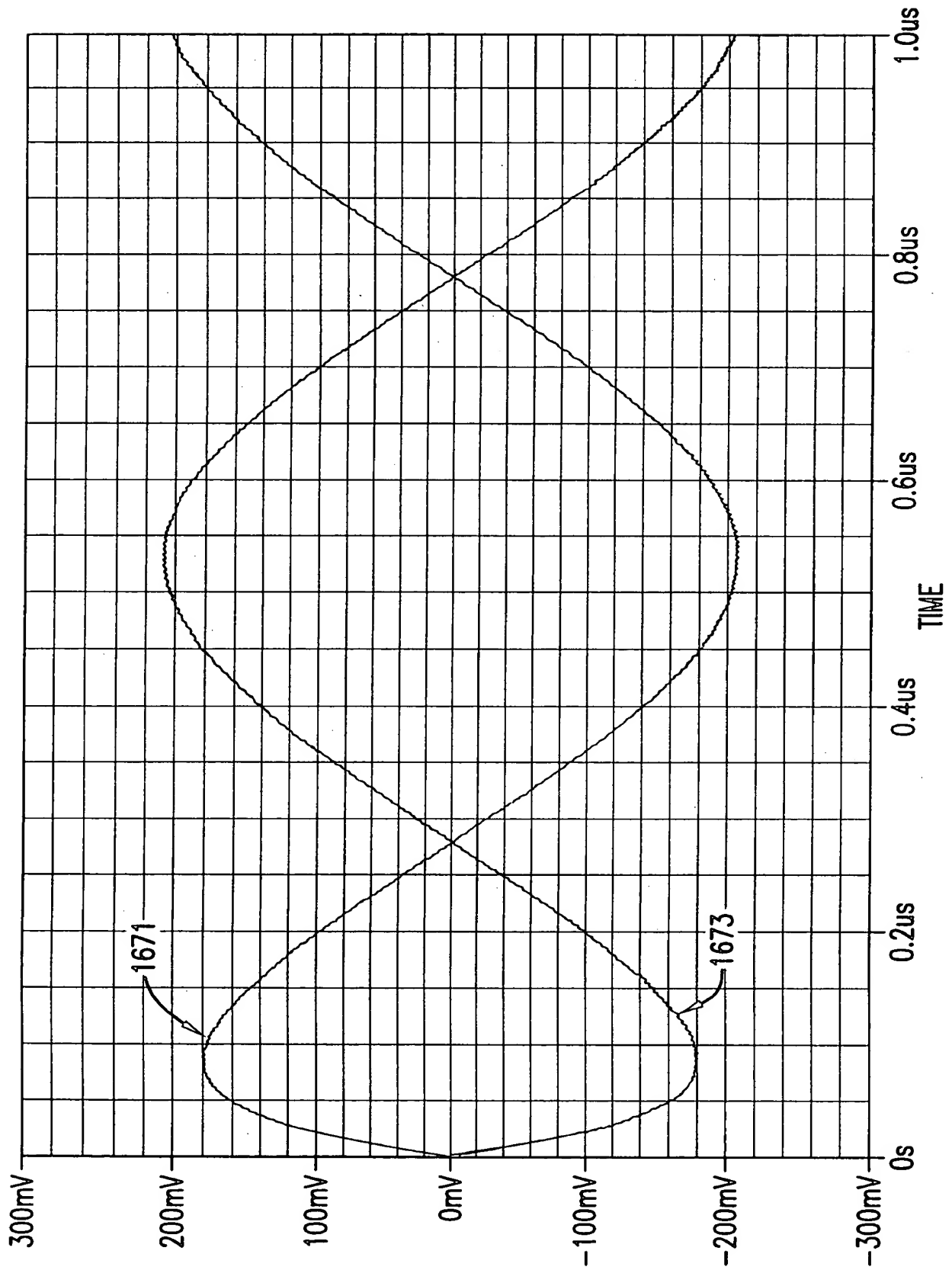
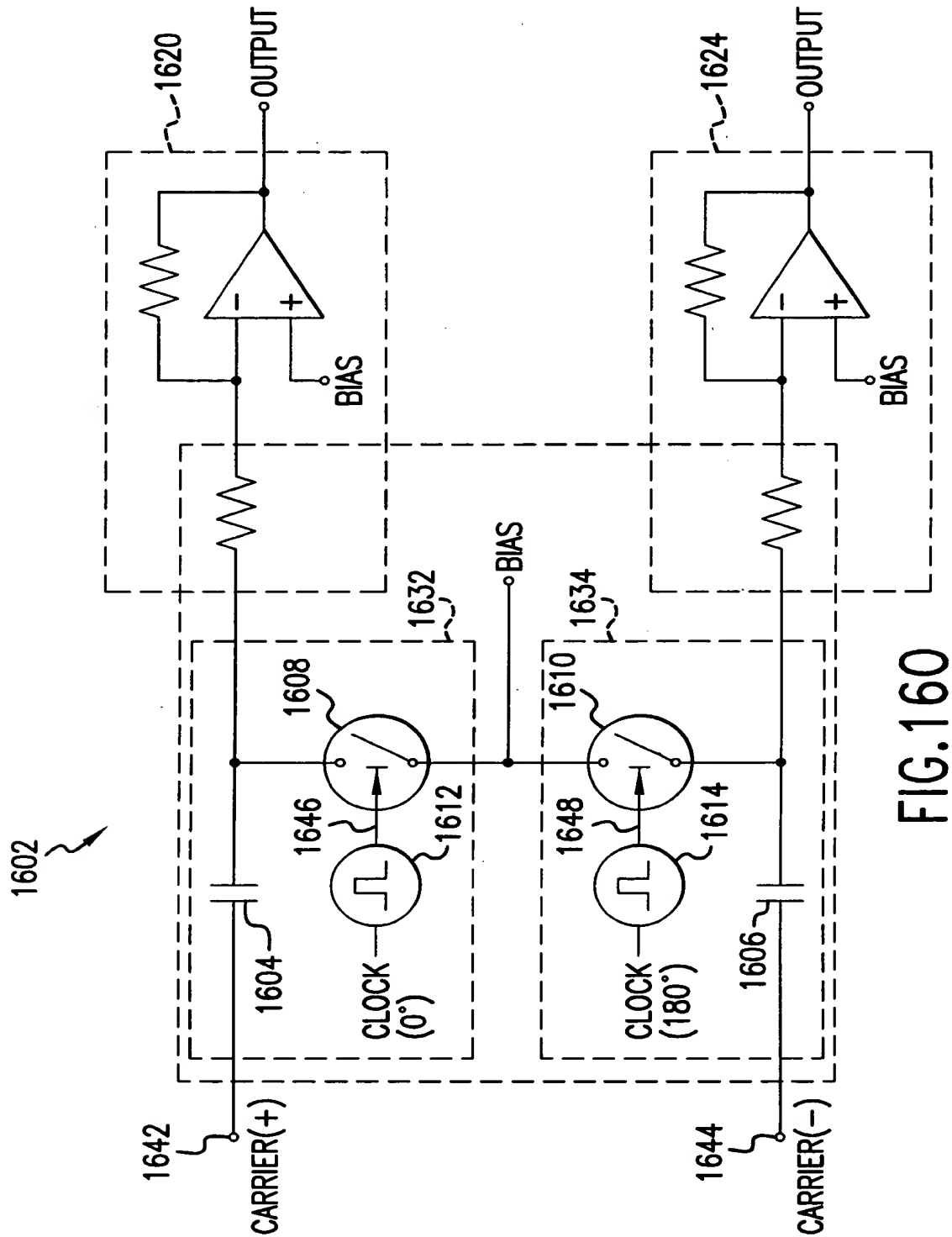


FIG. 16N



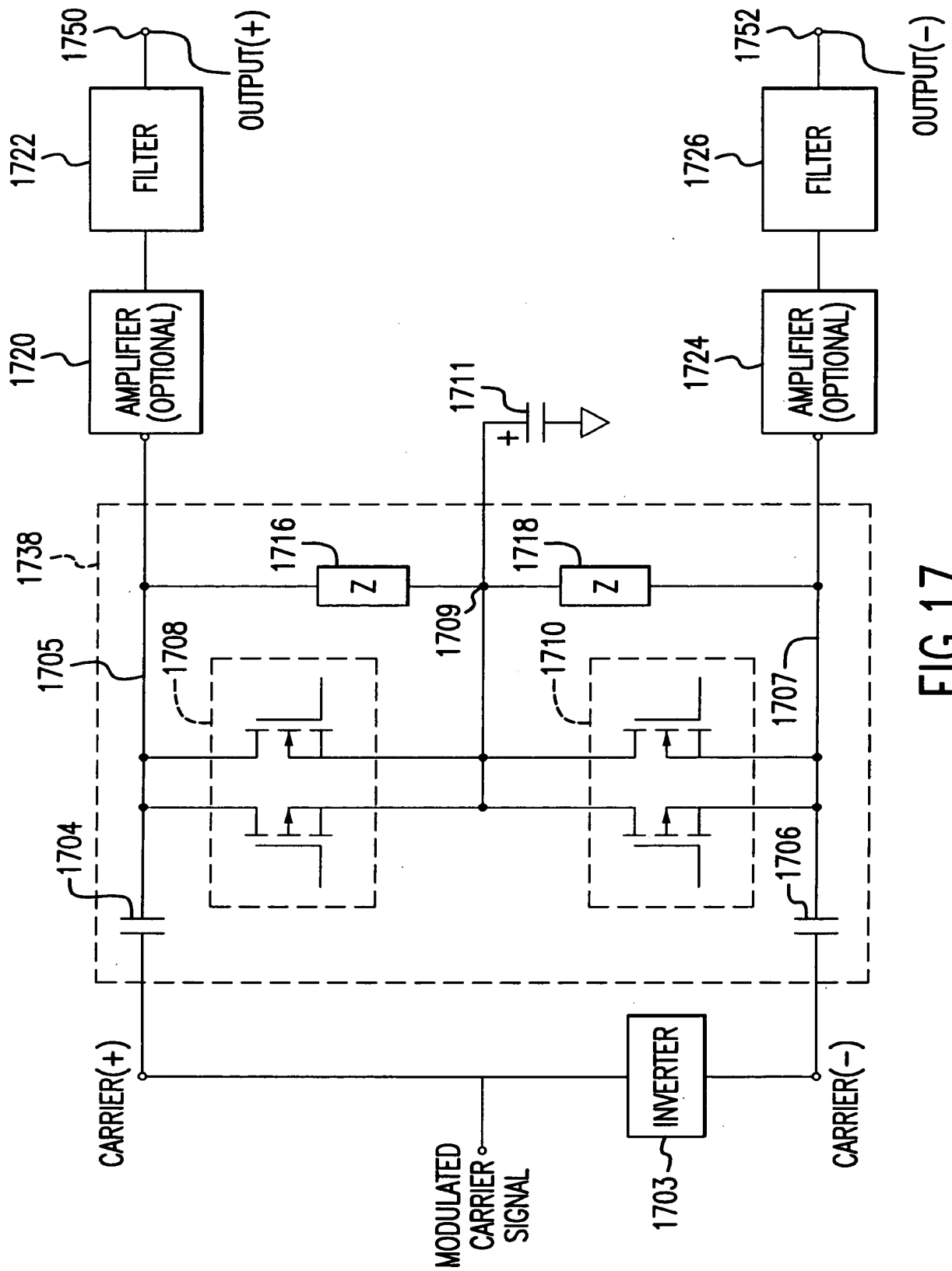


FIG.17

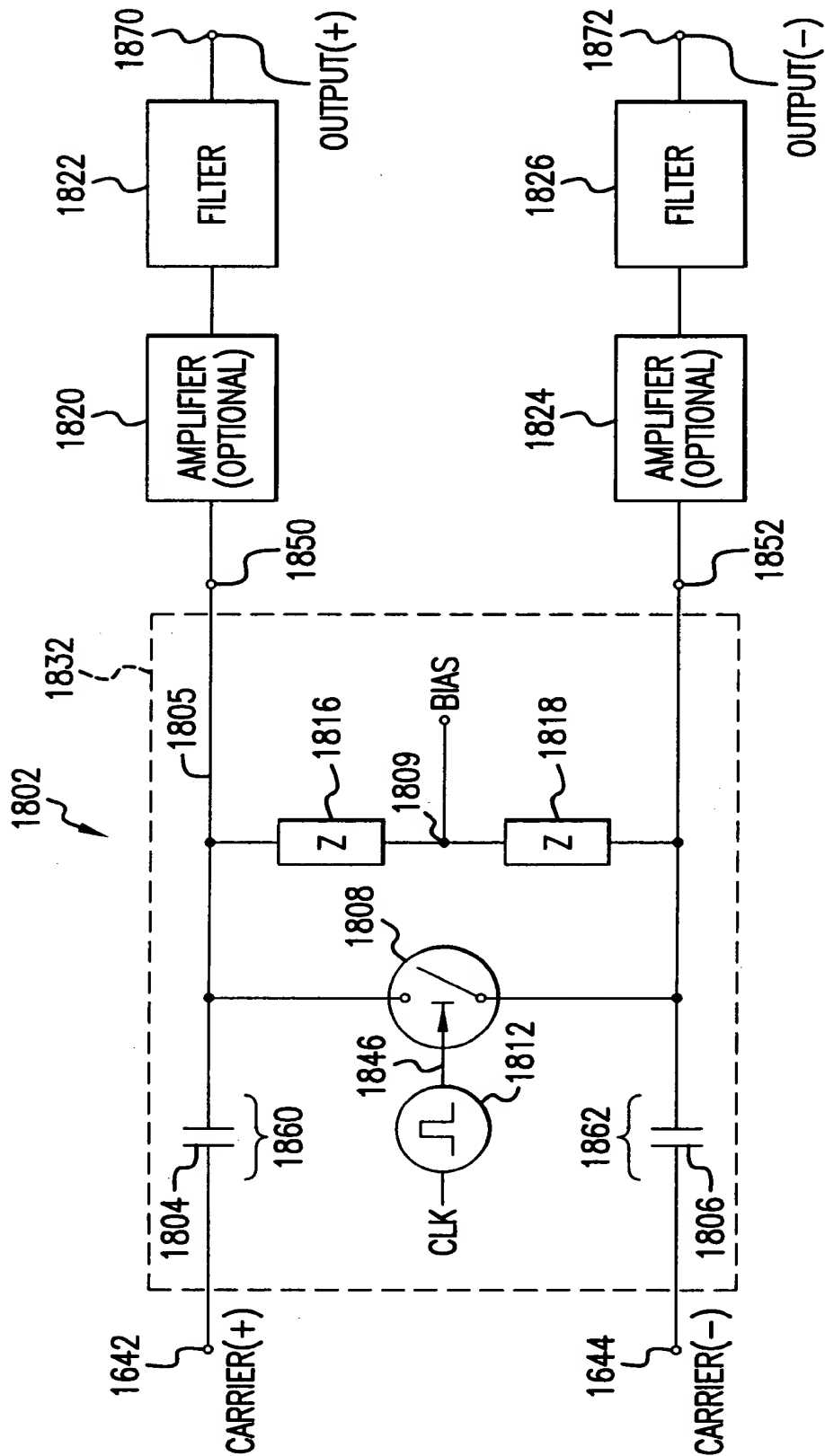


FIG. 18A

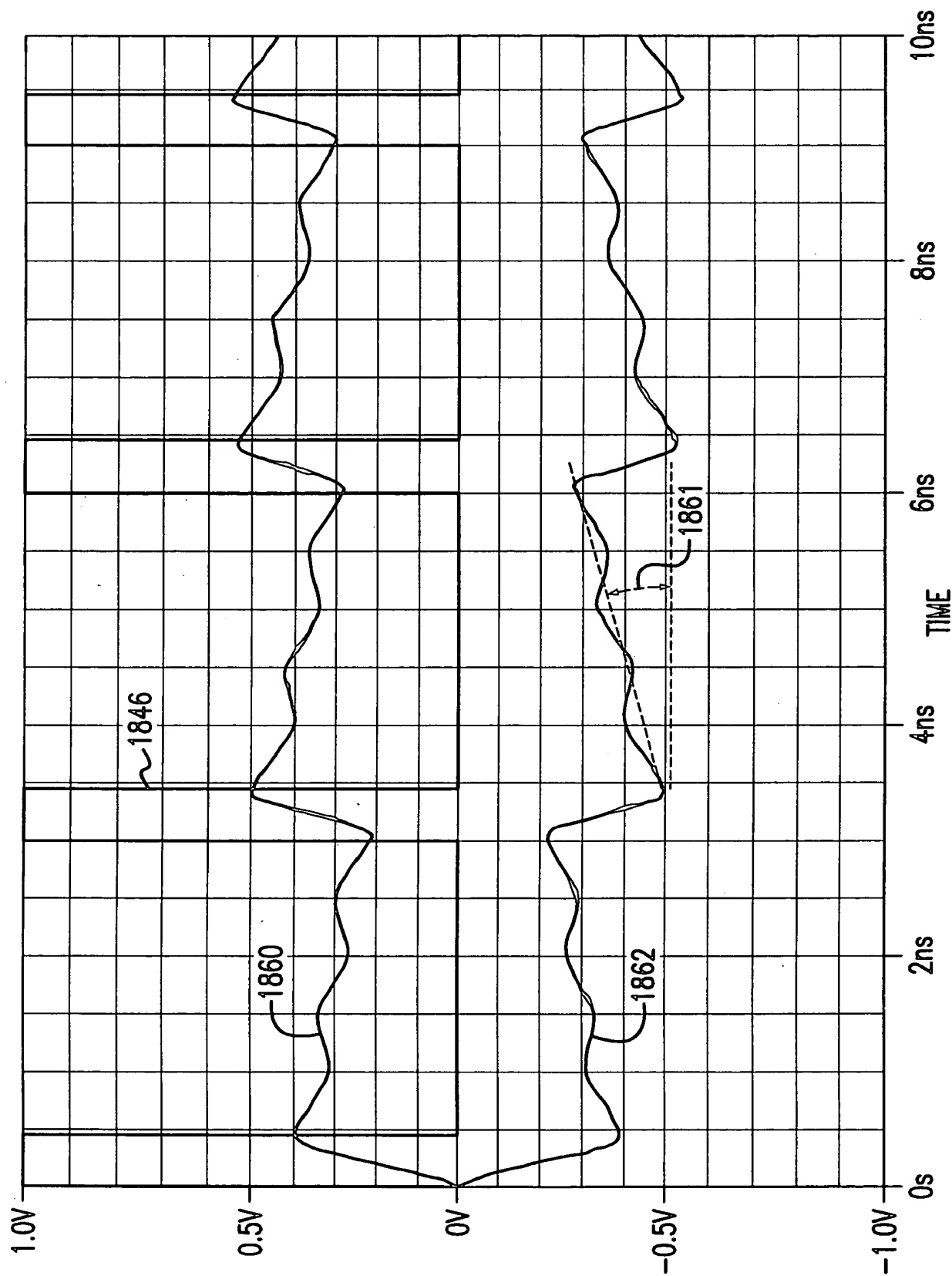


FIG. 18B

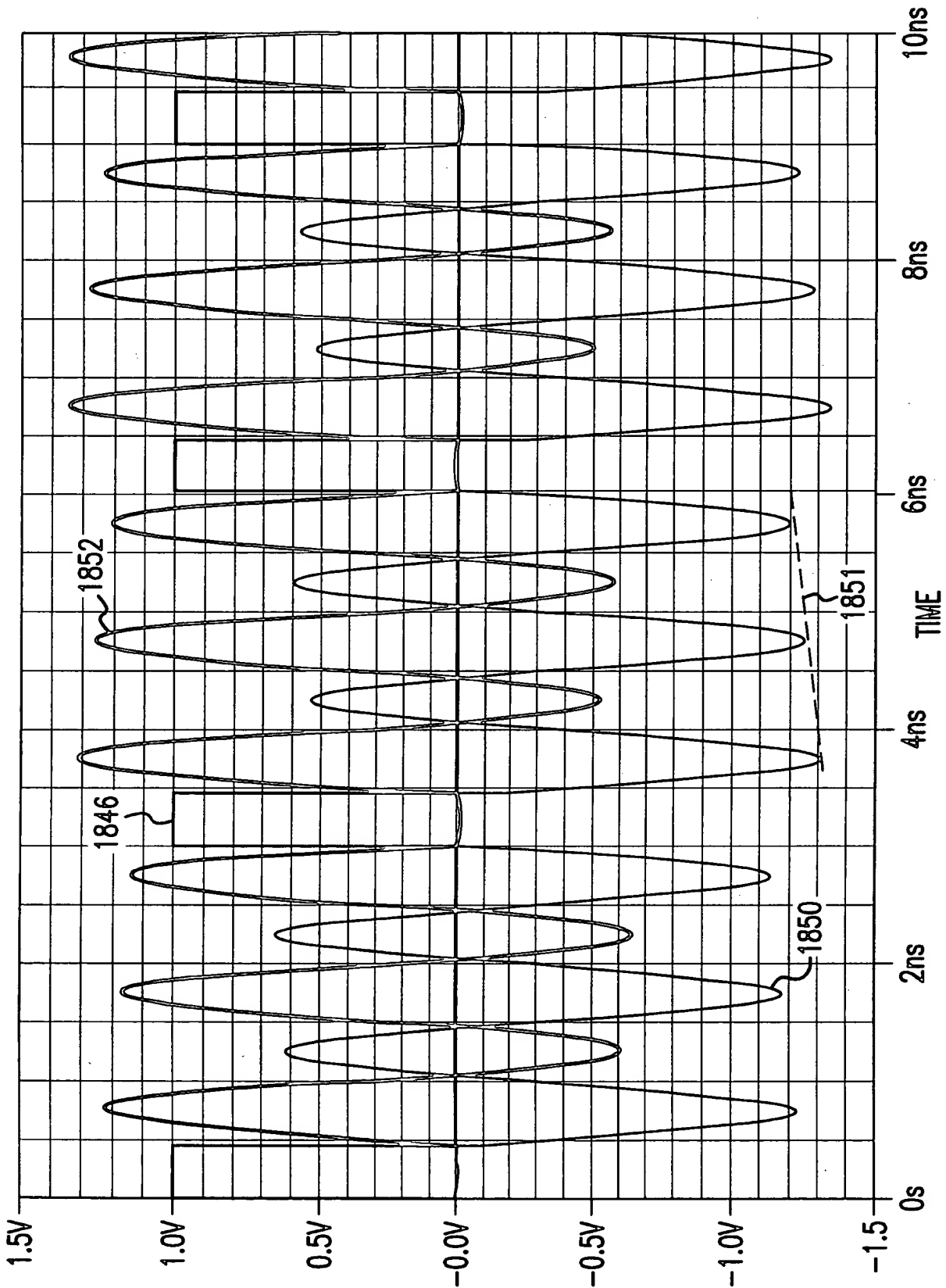


FIG. 18C

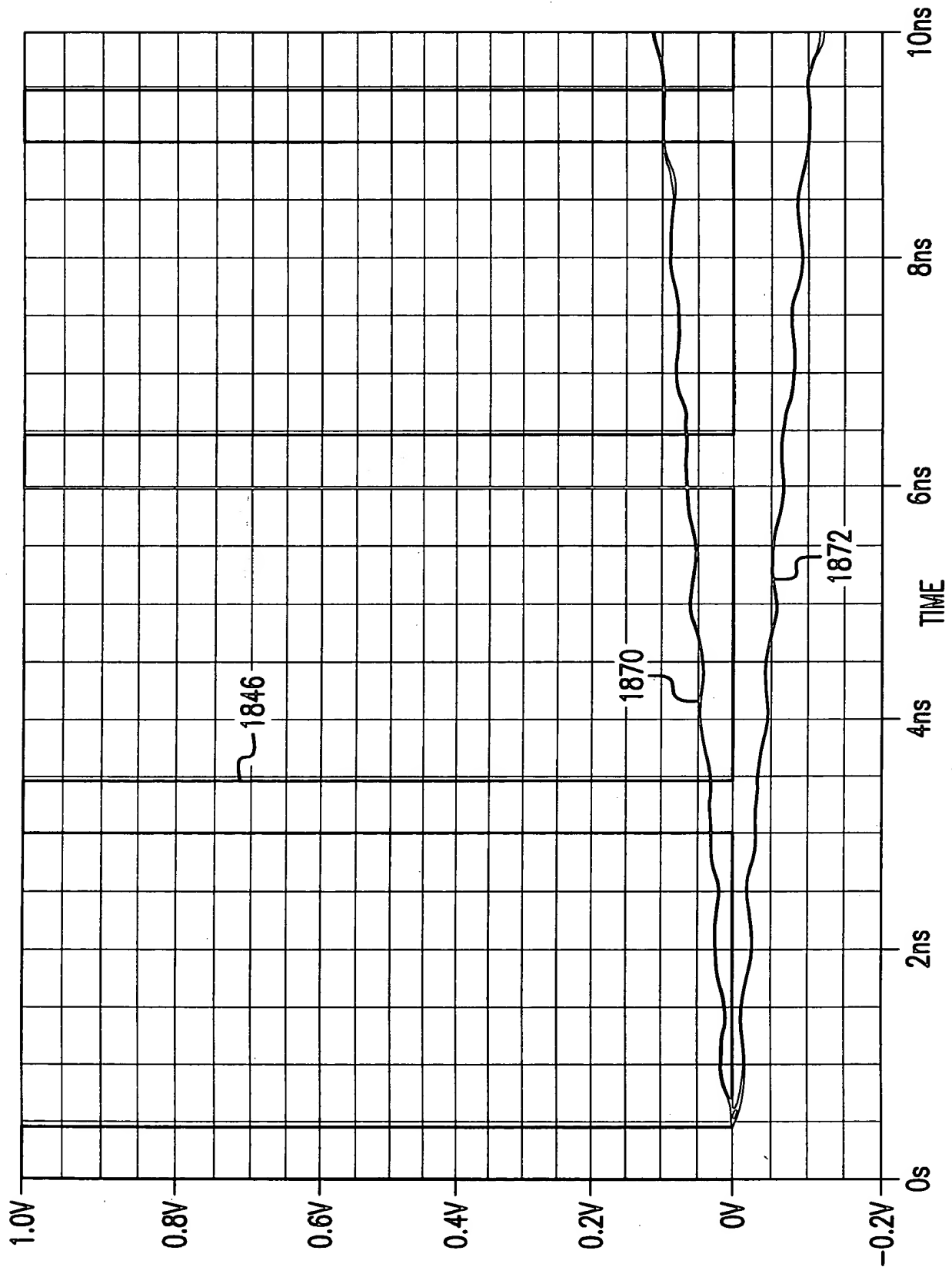


FIG. 18D

Appl. No. 09/855,851; Group Art Unit: 2681
Dkt. No. 1744.1260001; Batch No.: (to be assigned)
Inventor(s): Sorrells *et al.*; Tel: 202/371-2600
Title: Apparatus, System, and Method for Down-Converting
and Up-Converting Electromagnetic Signals

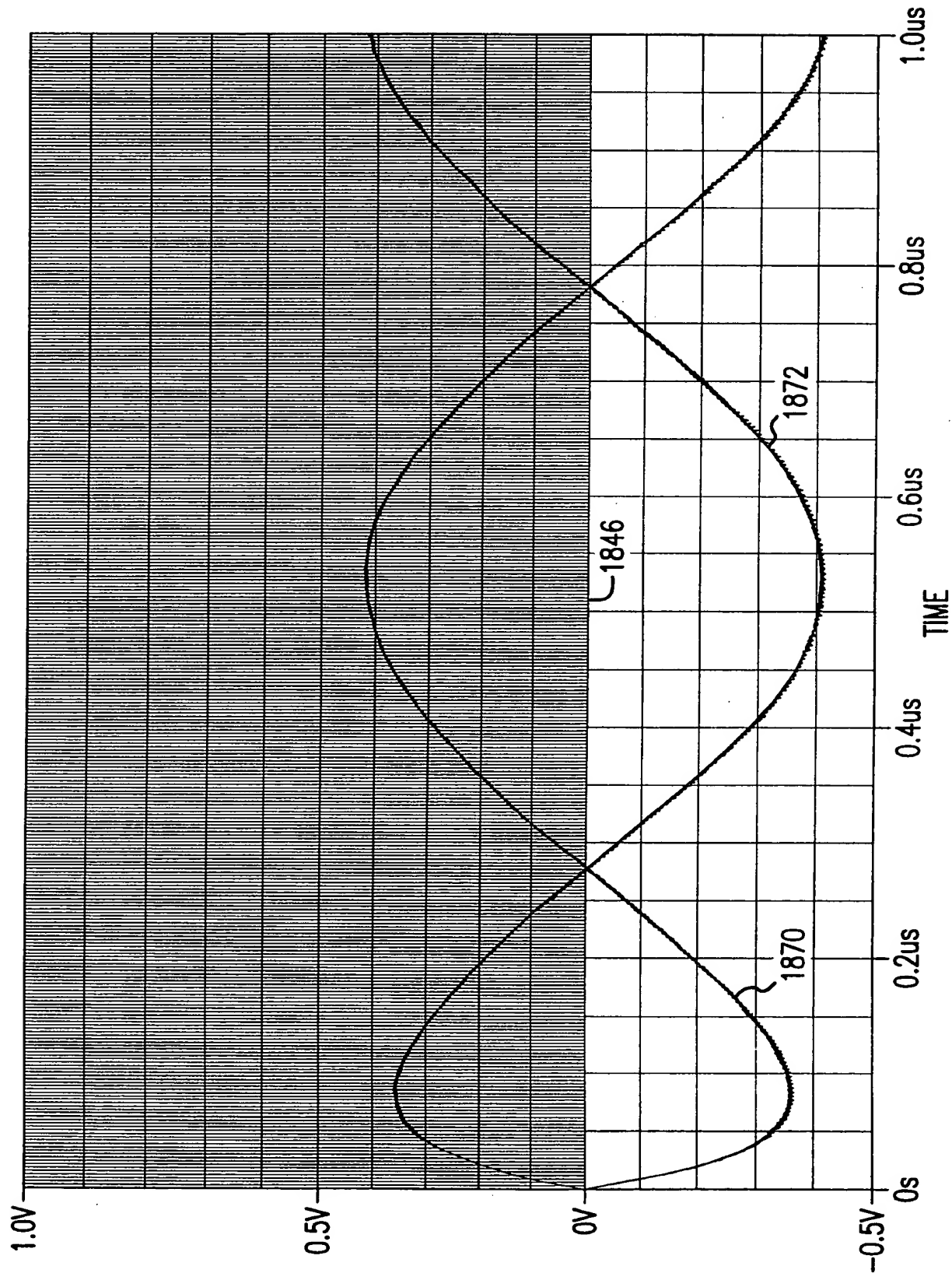


FIG.18E

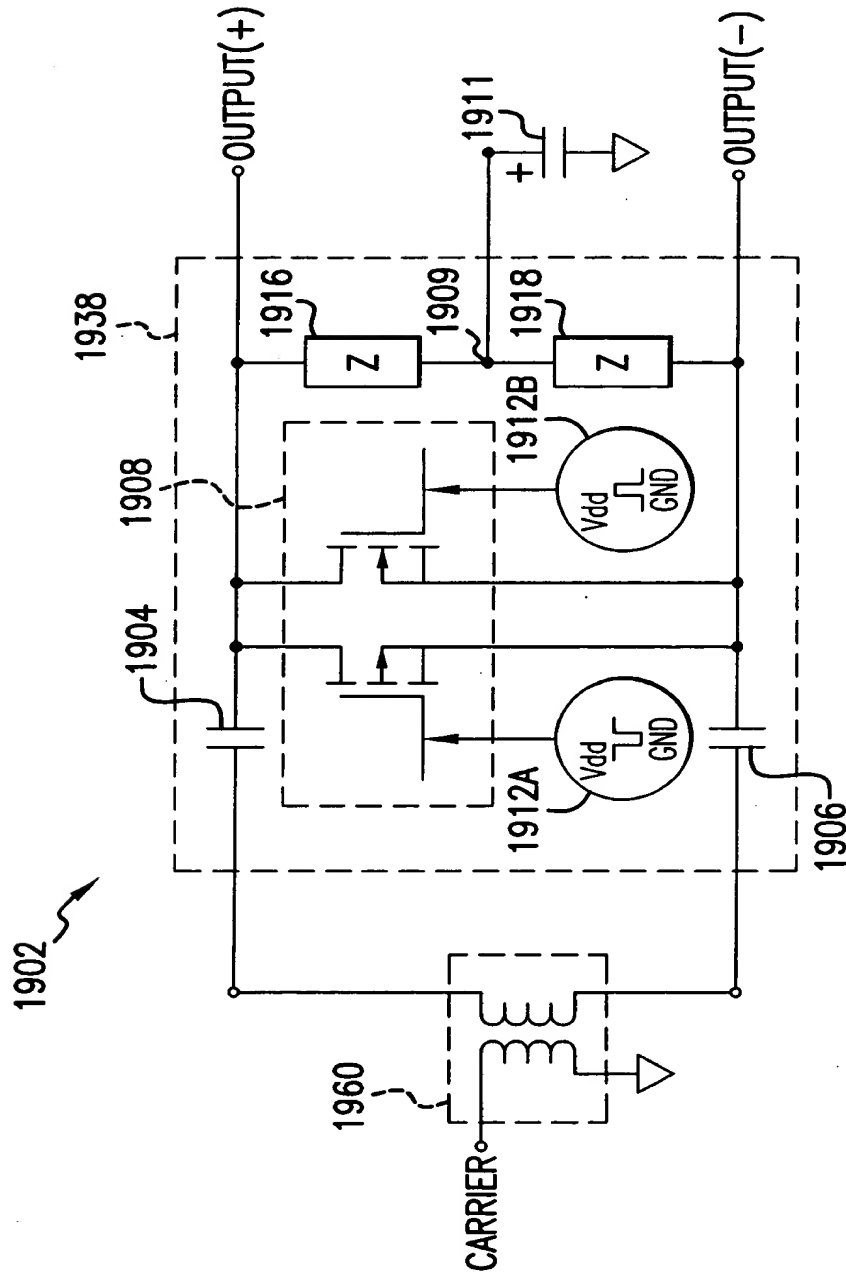


FIG. 19

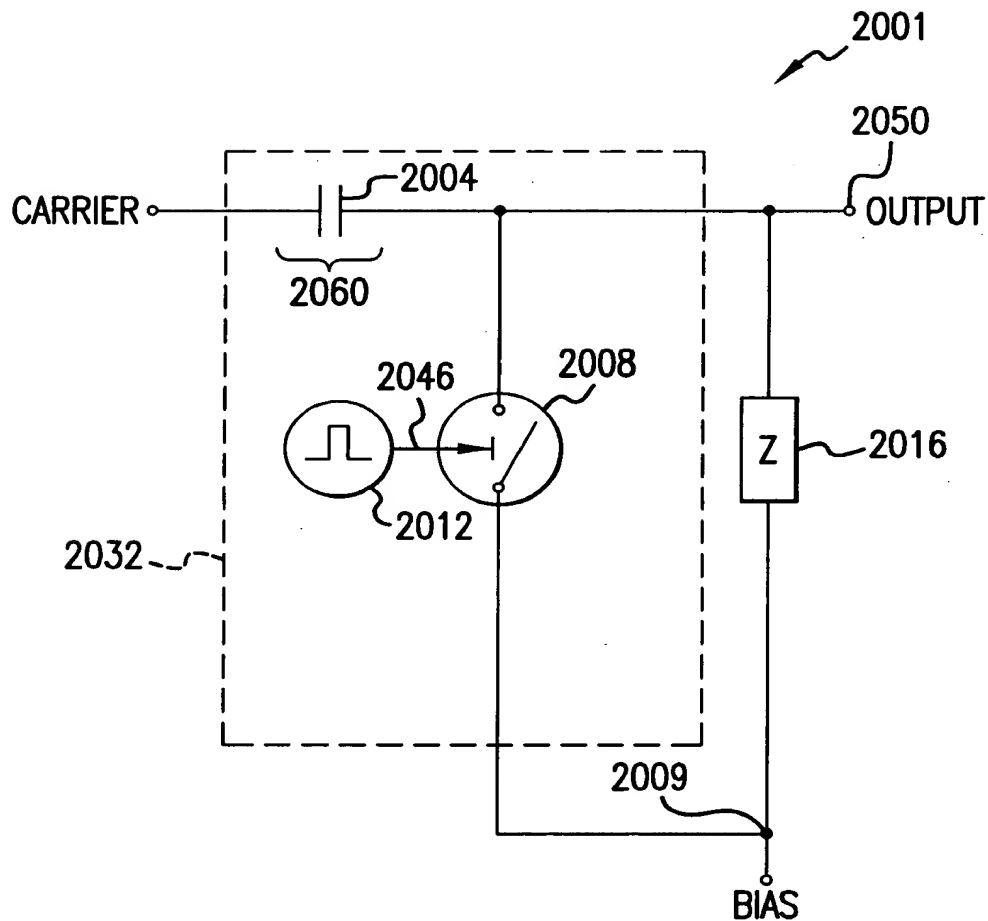


FIG. 20A

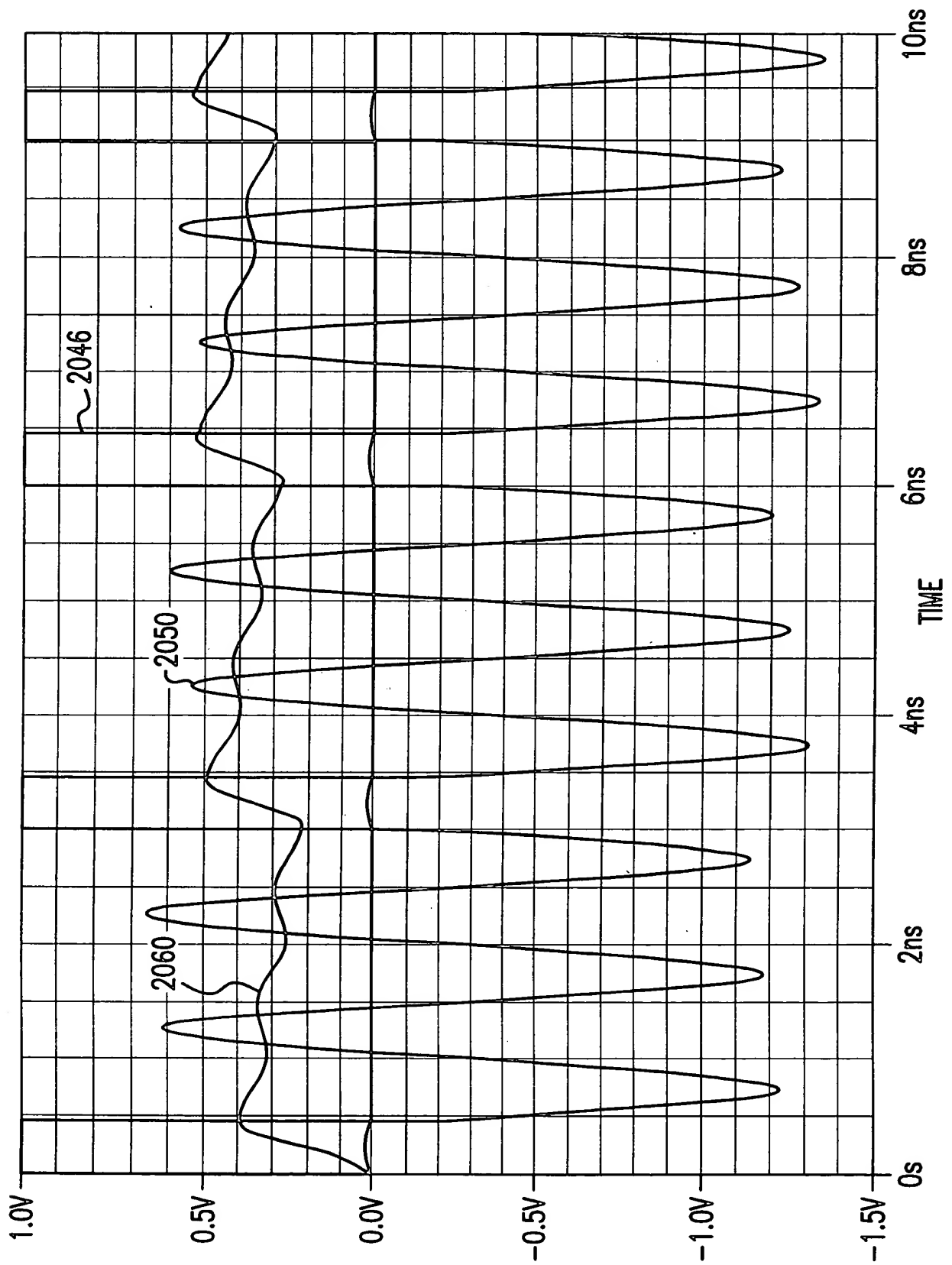


FIG.20B

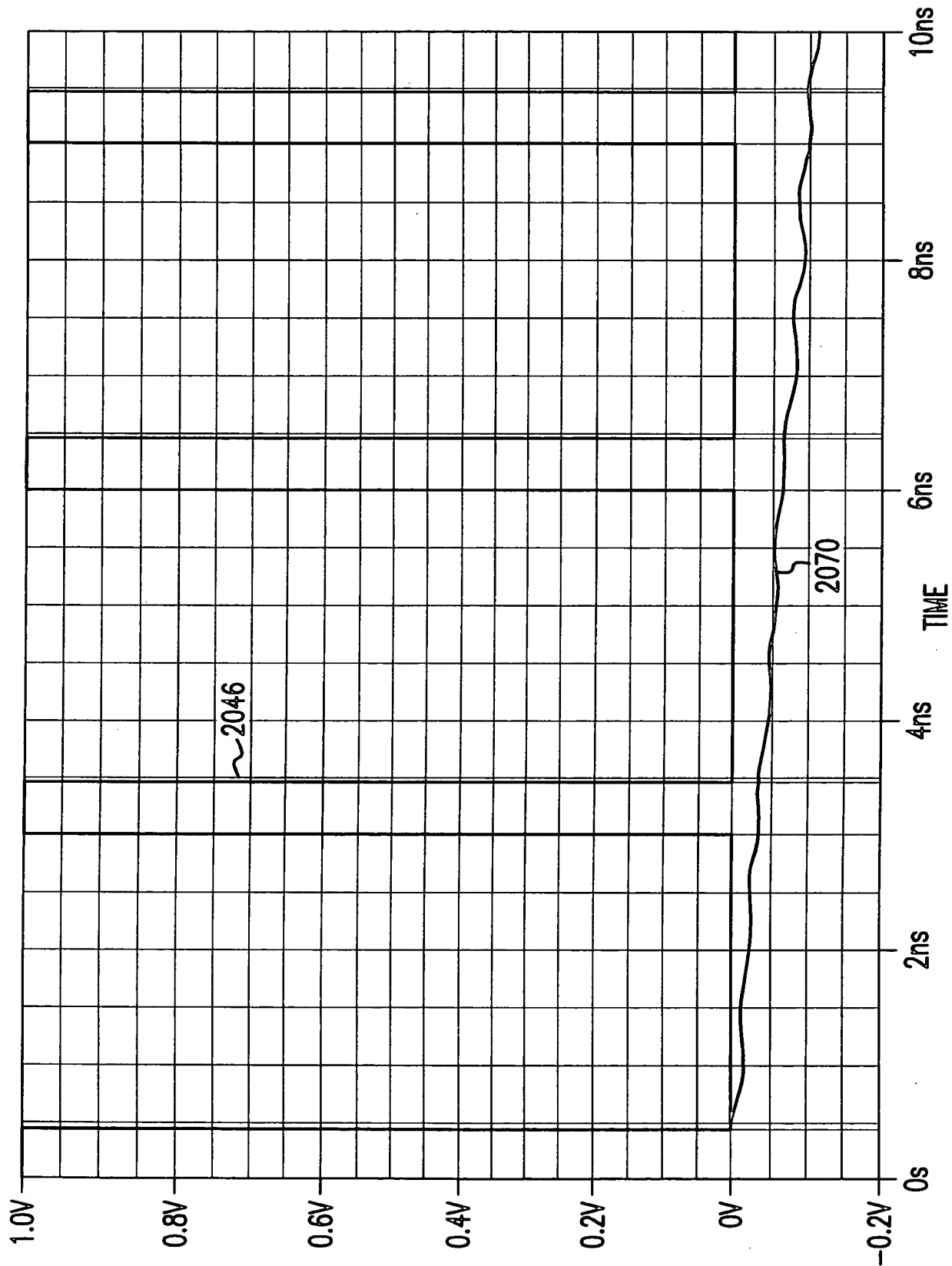


FIG. 20C

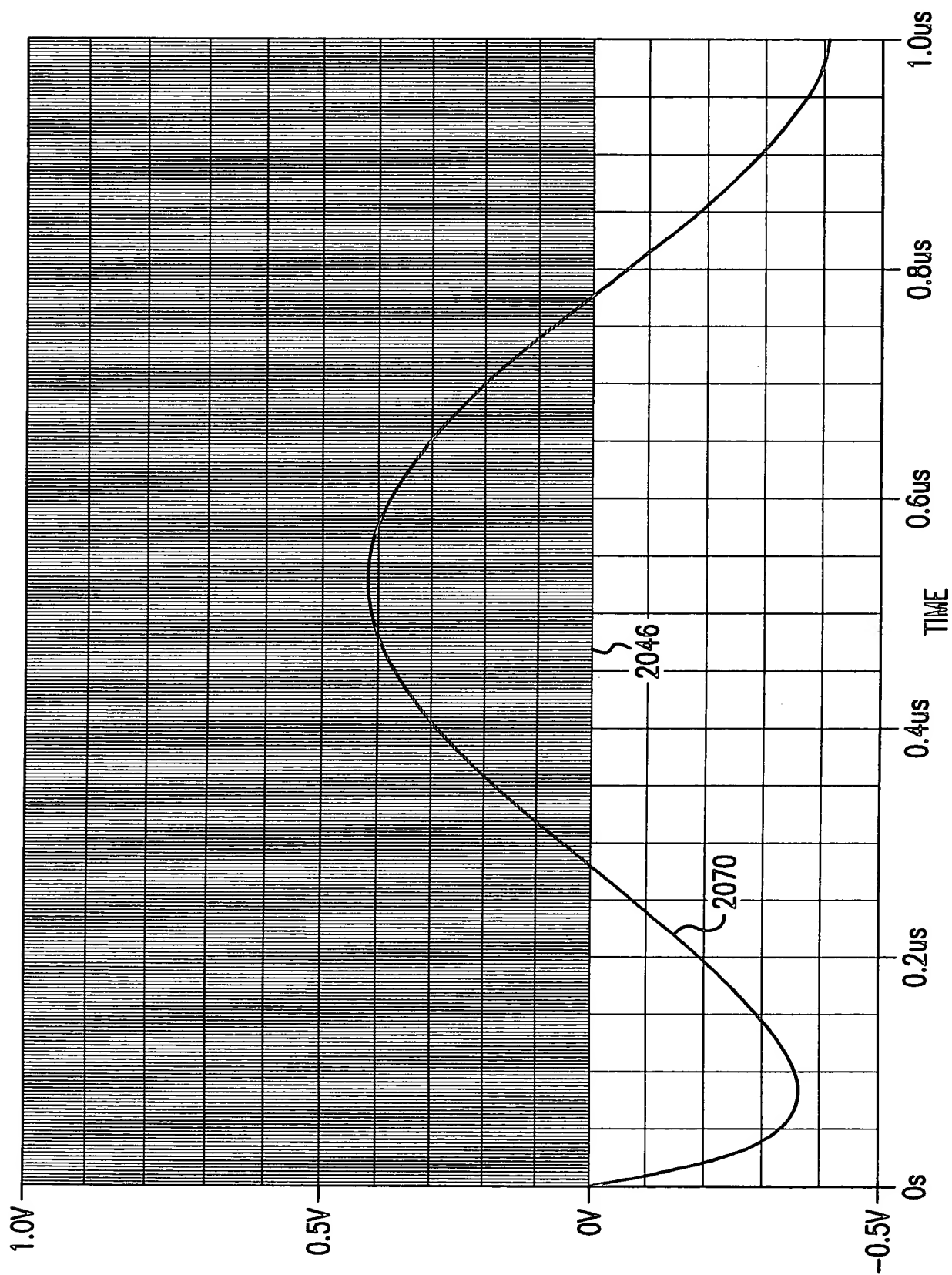


FIG. 20D

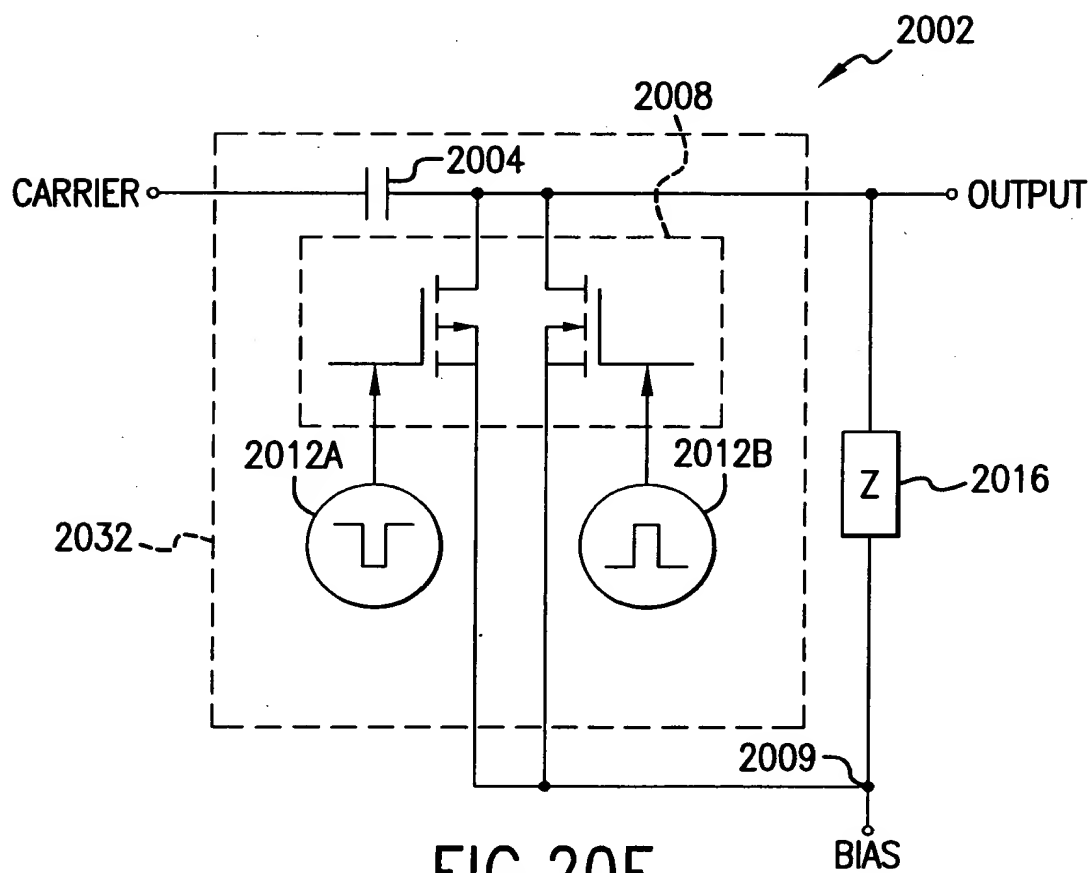


FIG. 20E

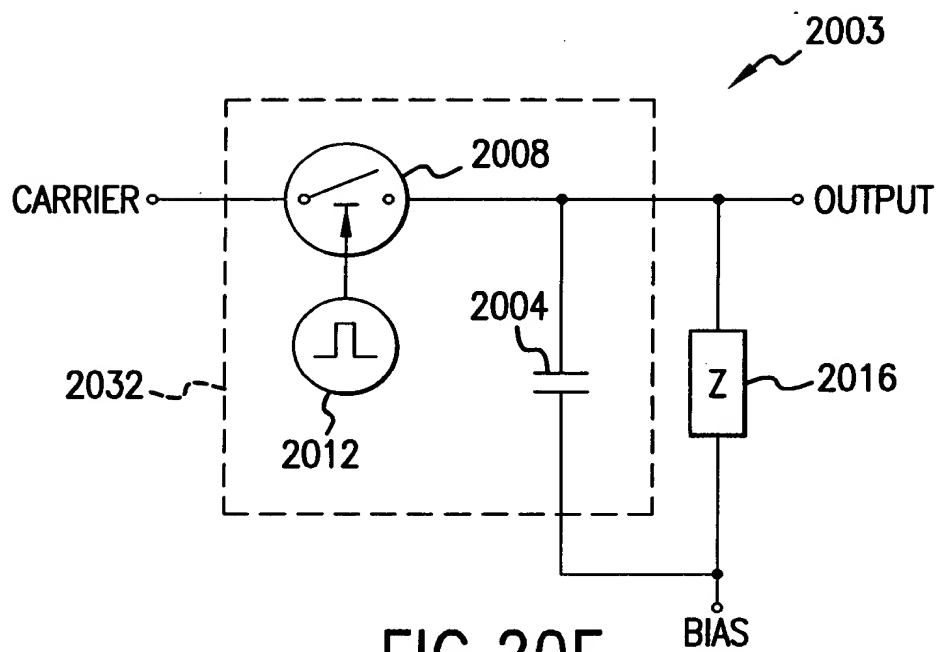


FIG.20F

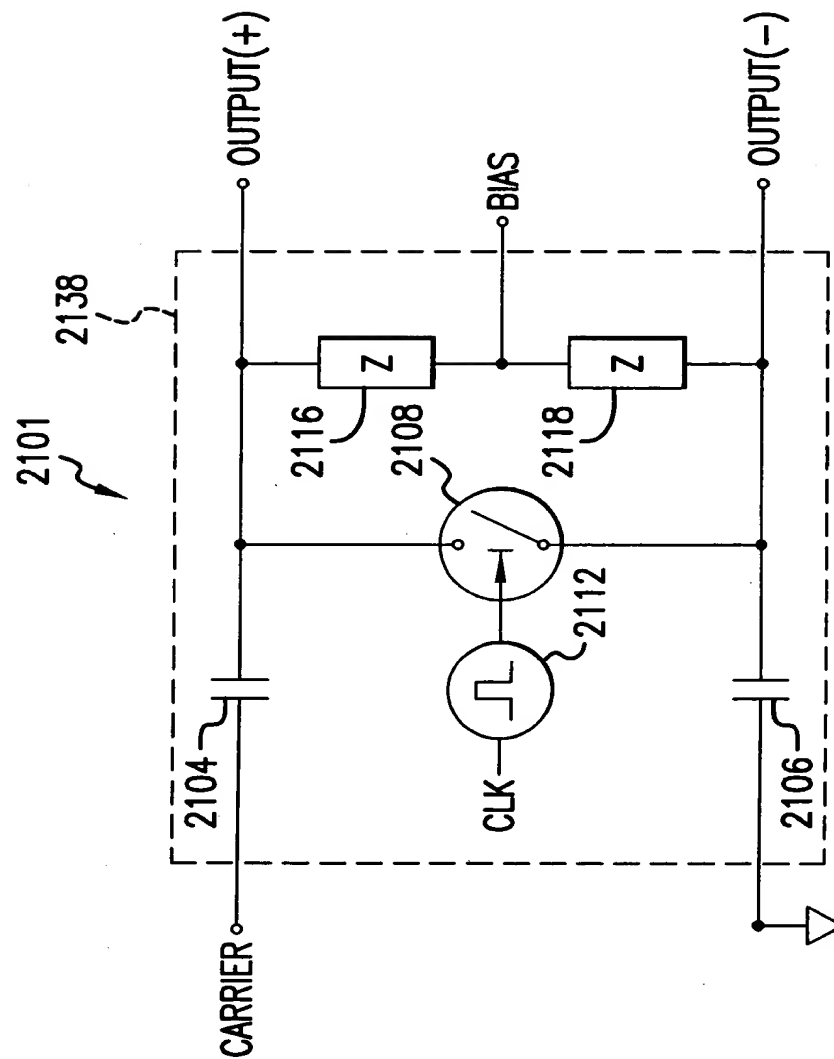


FIG. 21

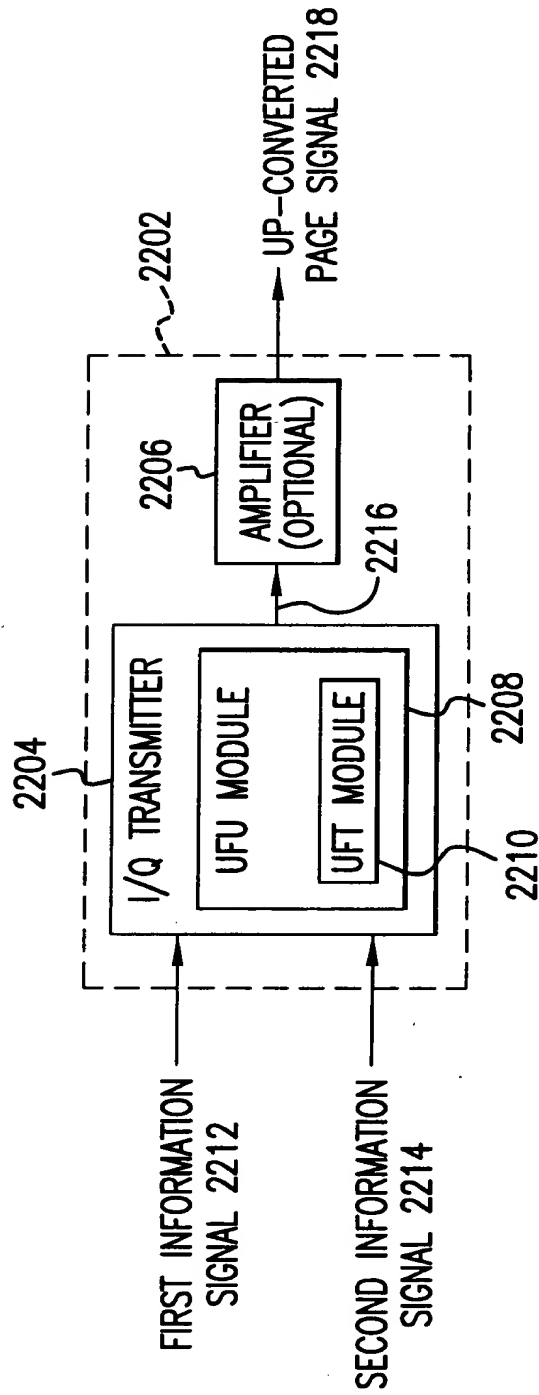


FIG. 22

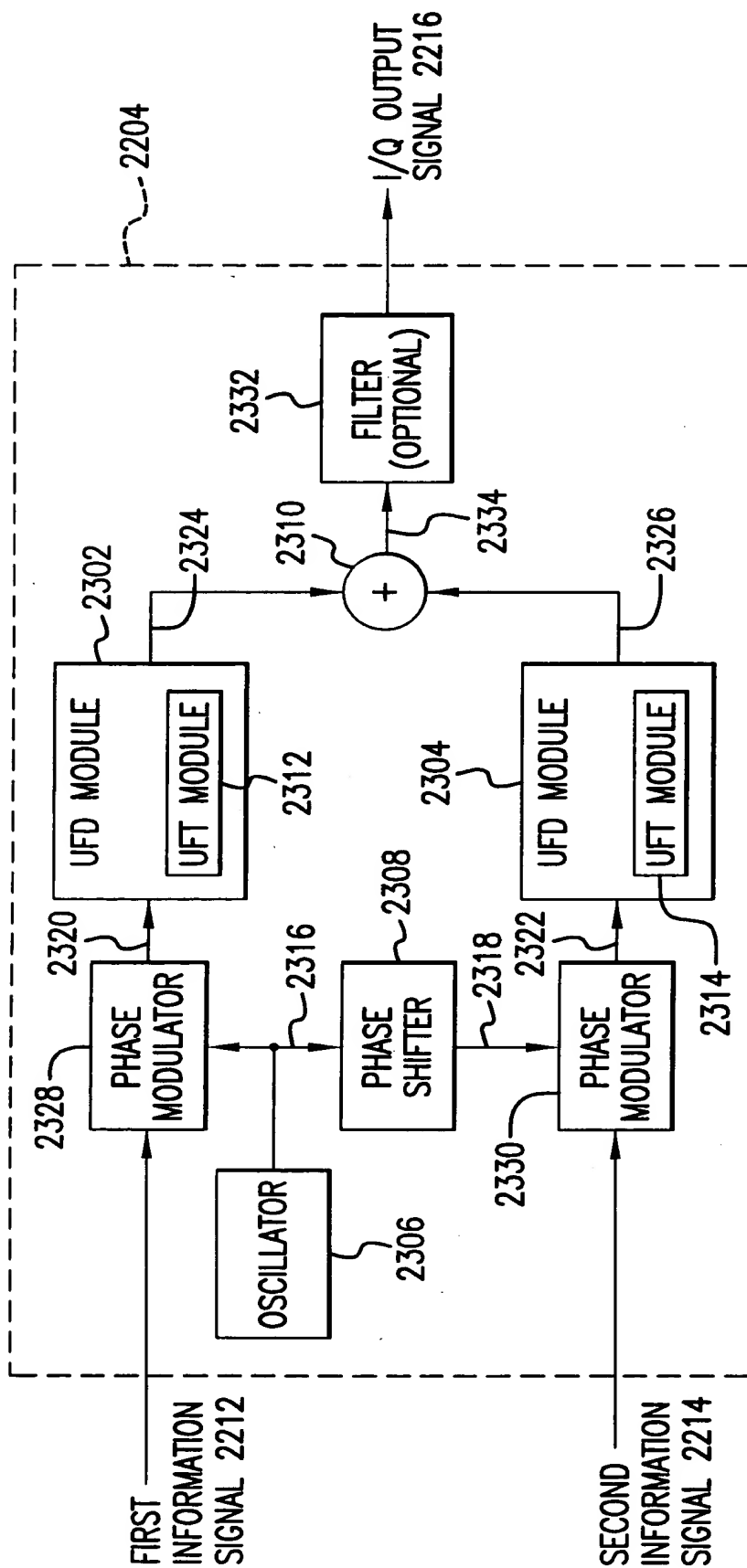


FIG. 23

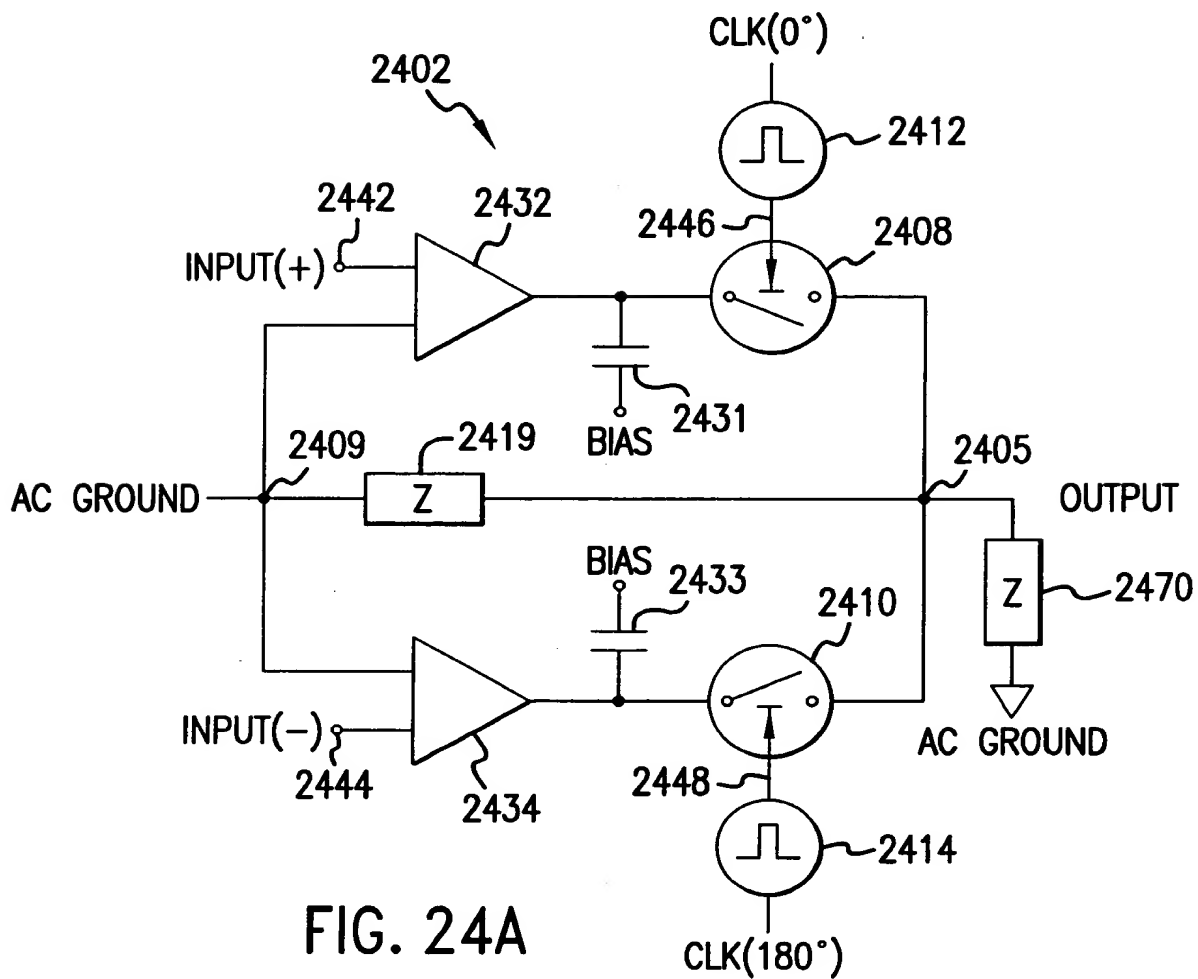


FIG. 24A

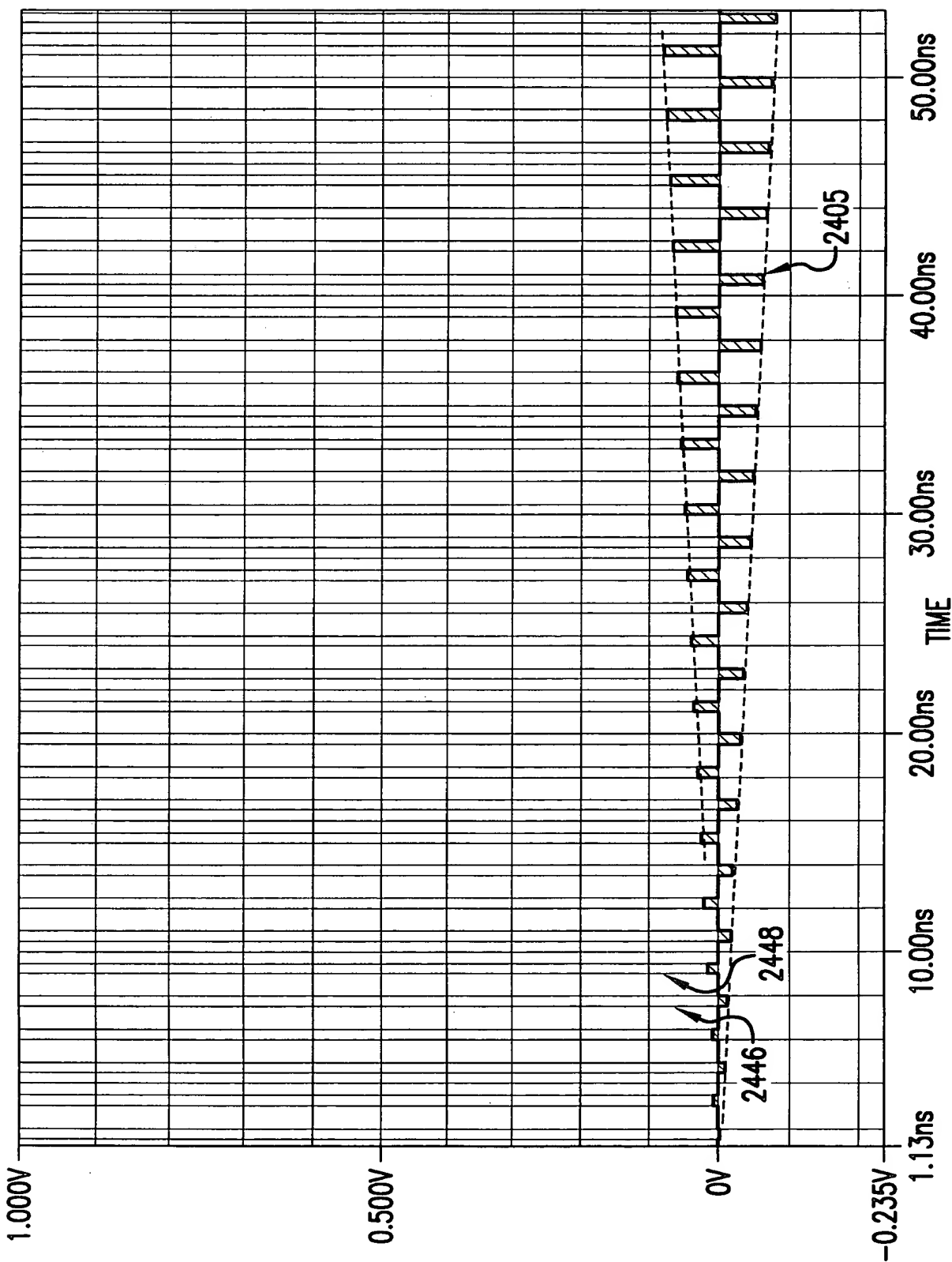


FIG. 24B

Appl. No. 09/855,851; Group Art Unit: 2681
 Dkt. No. 1744.1260001; Batch No.: (to be assigned)
 Inventor(s): Sorrells *et al.*; Tel: 202/371-2600
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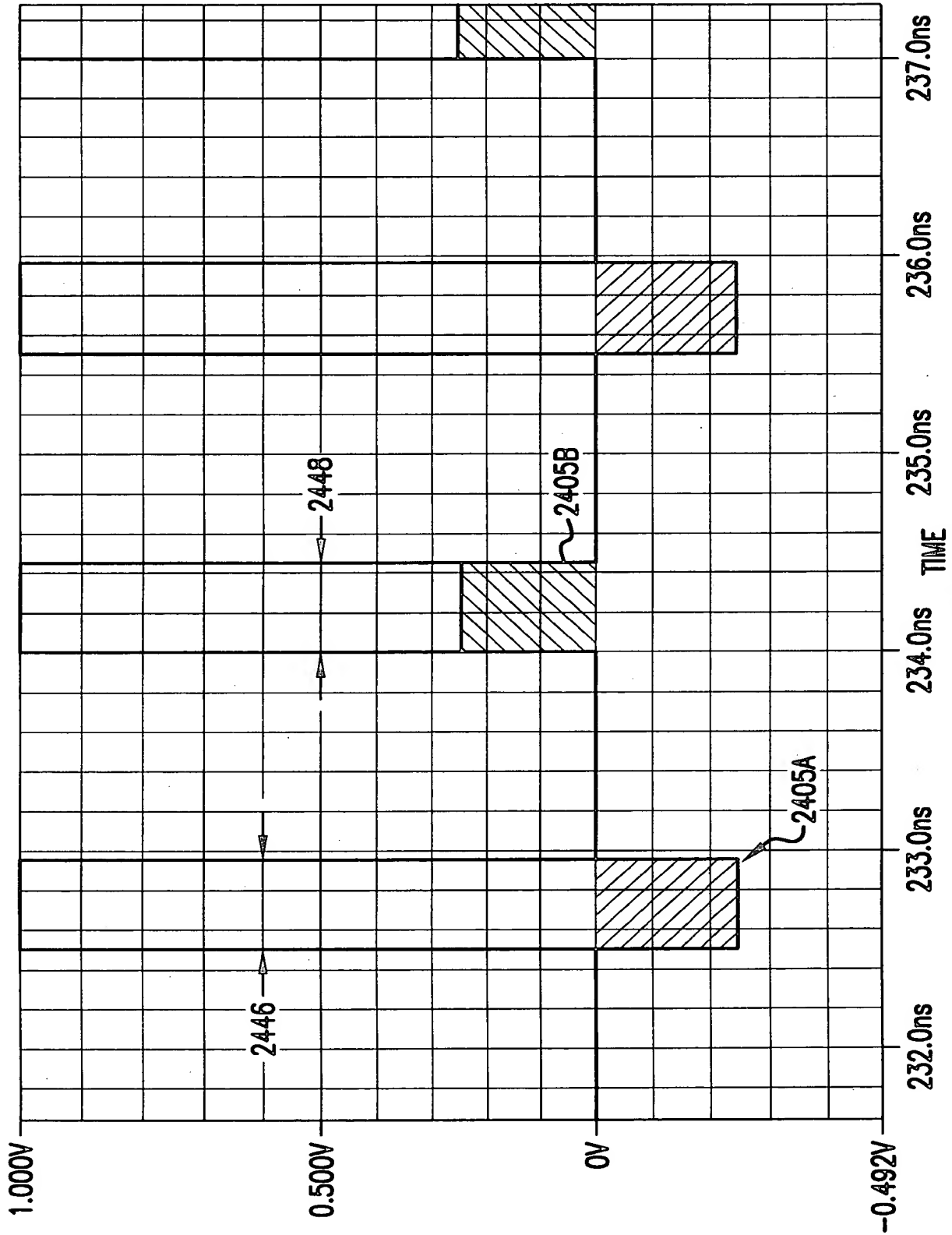


FIG. 24C

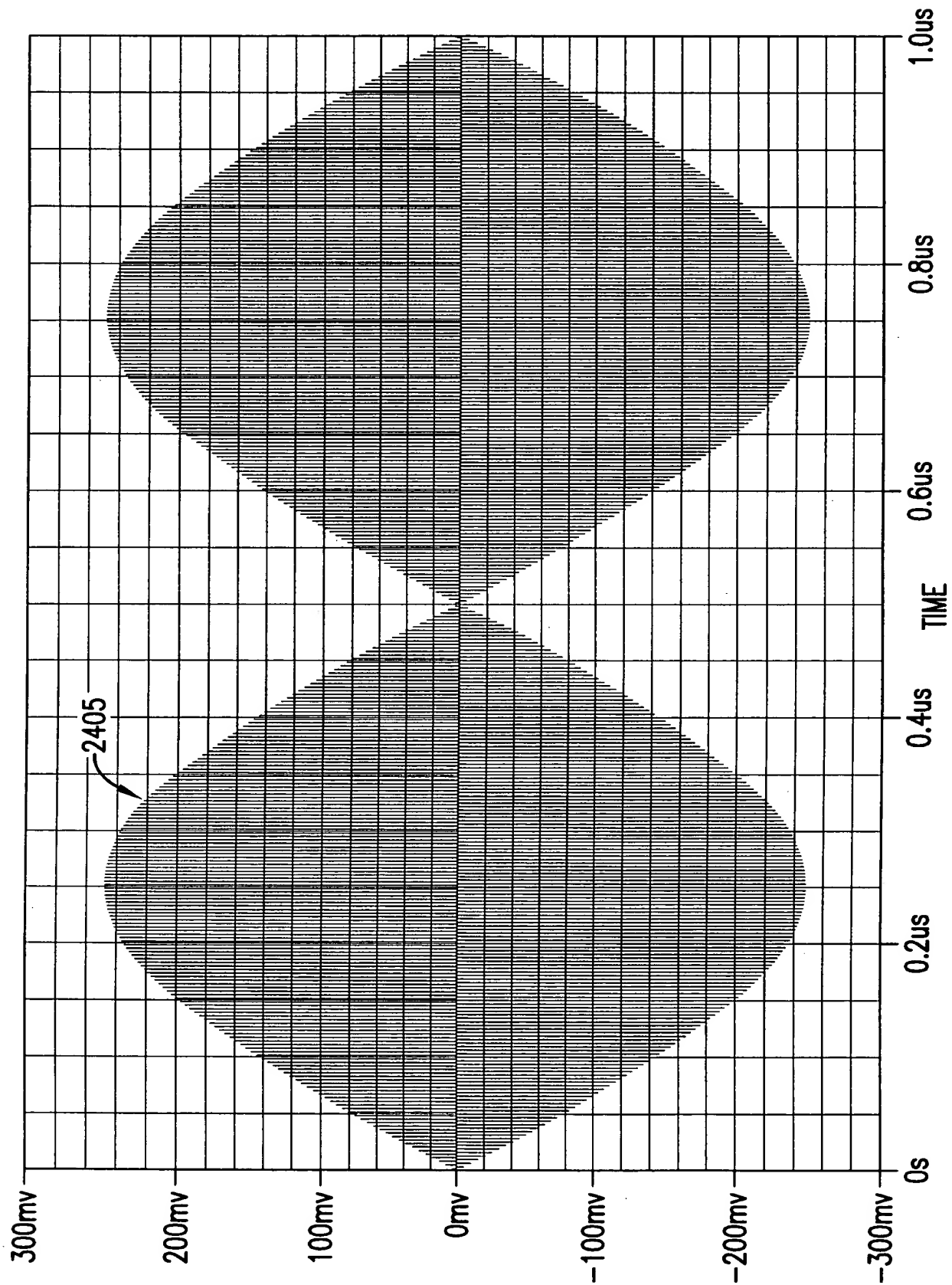


FIG. 24D

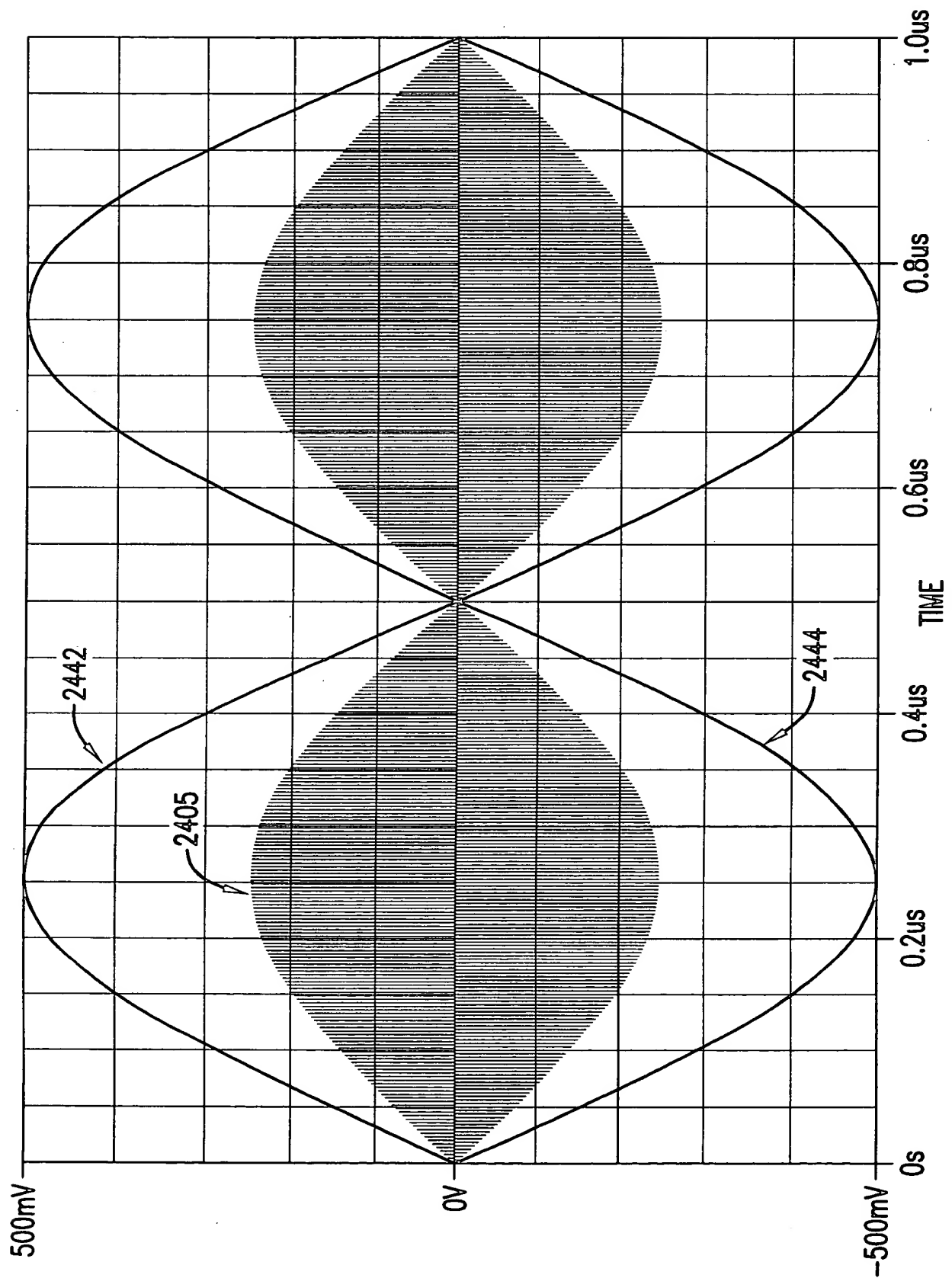


FIG. 24E

Appl. No. 09/855,851; Group Art Unit: 2681
Dkt. No. 1744.1260001; Batch No.: (to be assigned)
Inventor(s): Sorrells *et al.*; Tel: 202/371-2600
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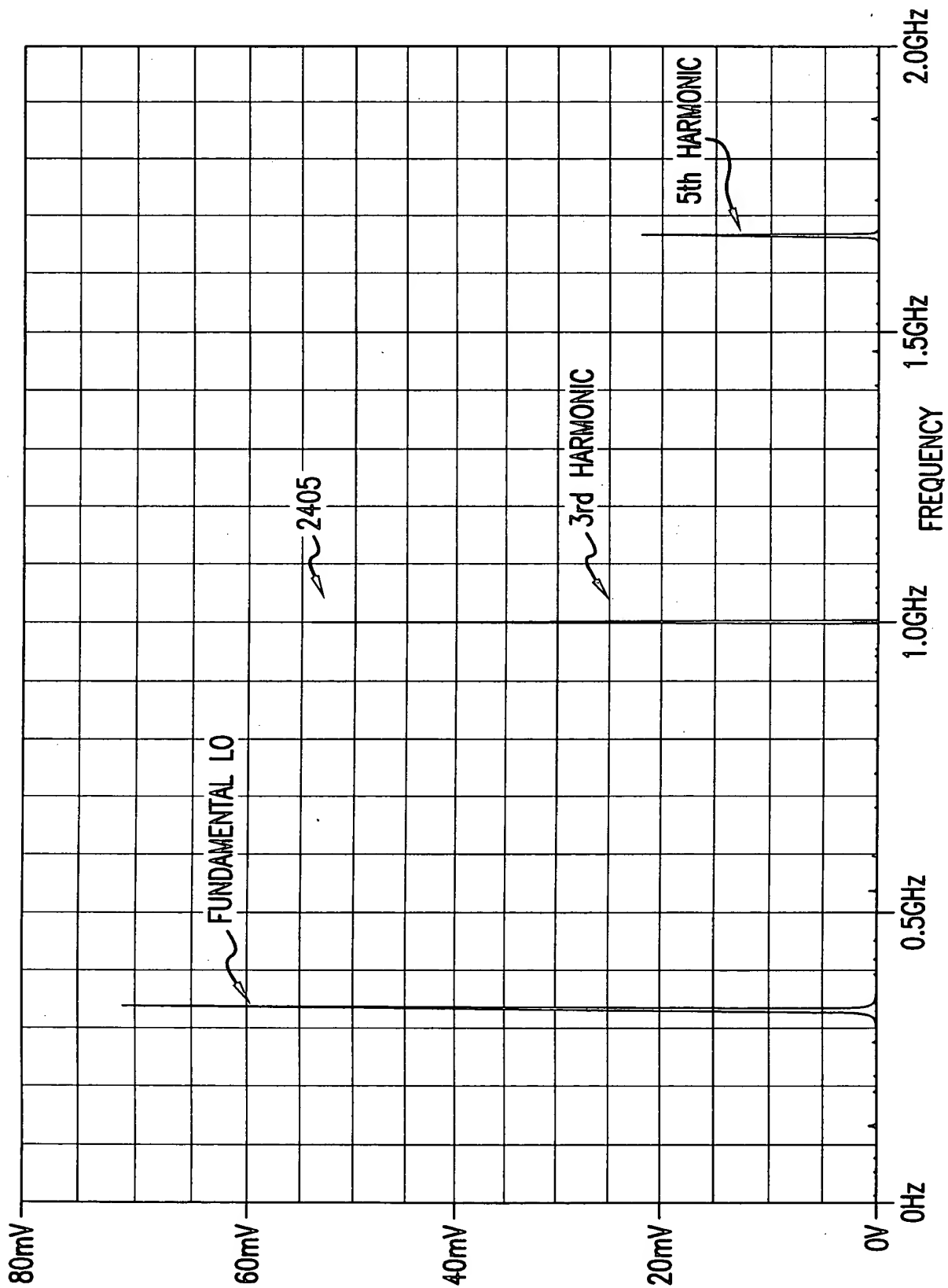
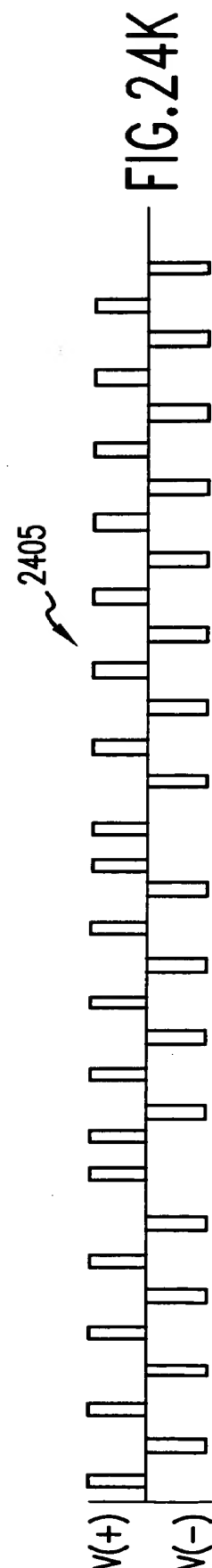
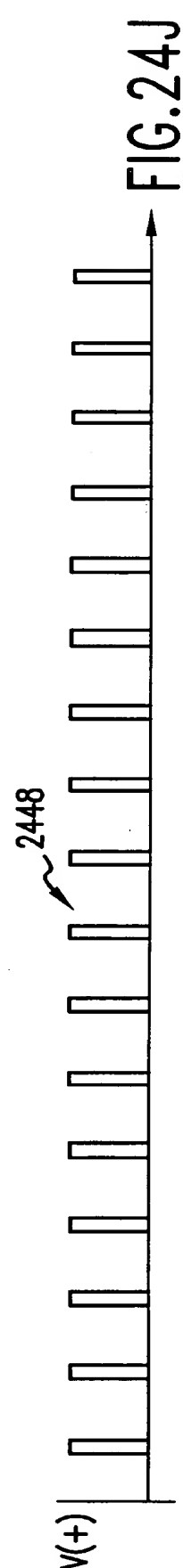
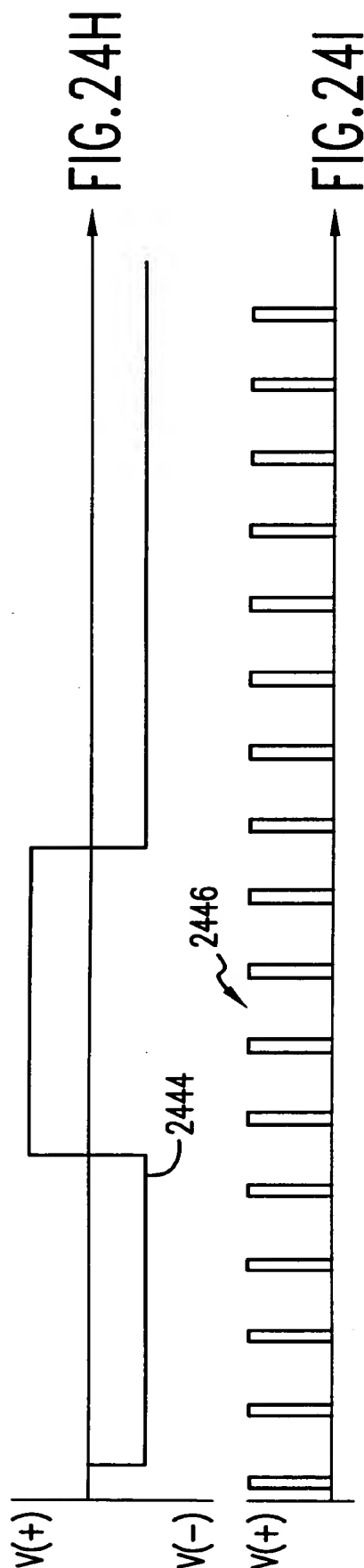
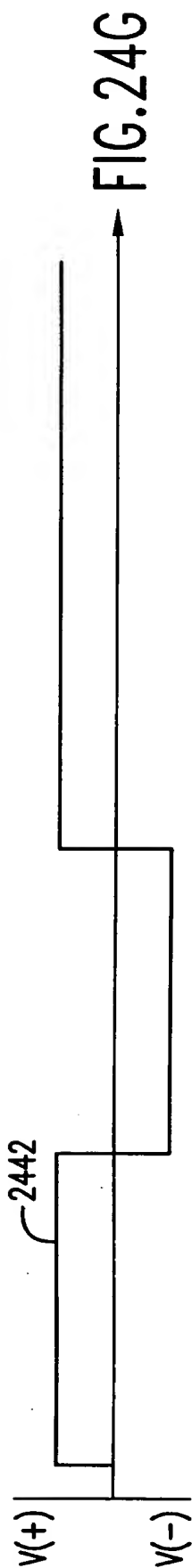
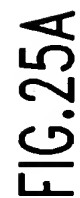
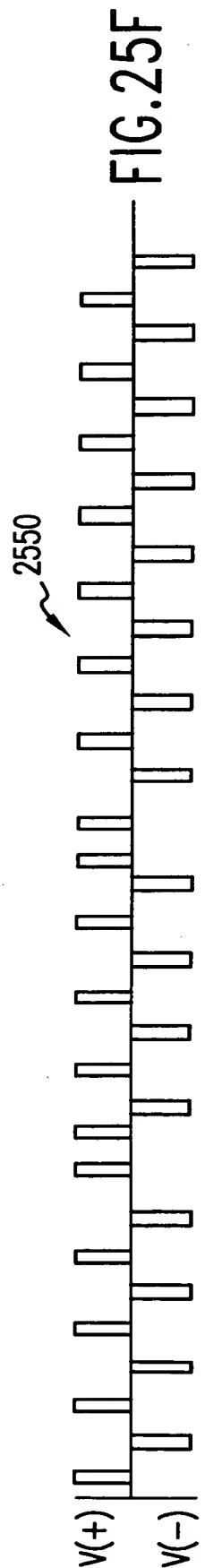
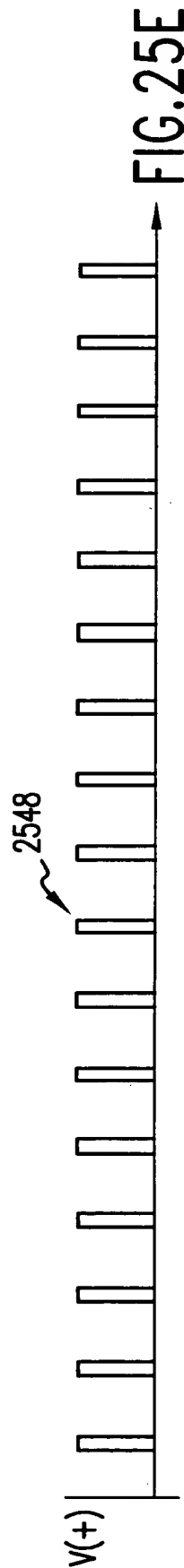
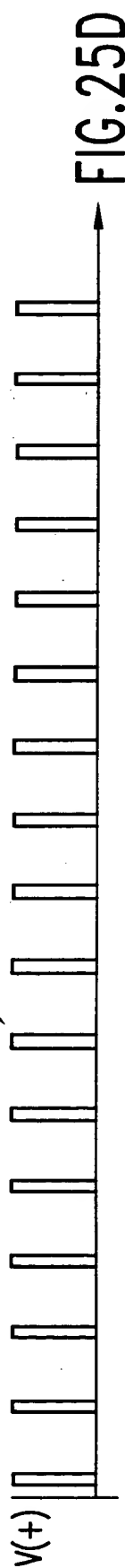
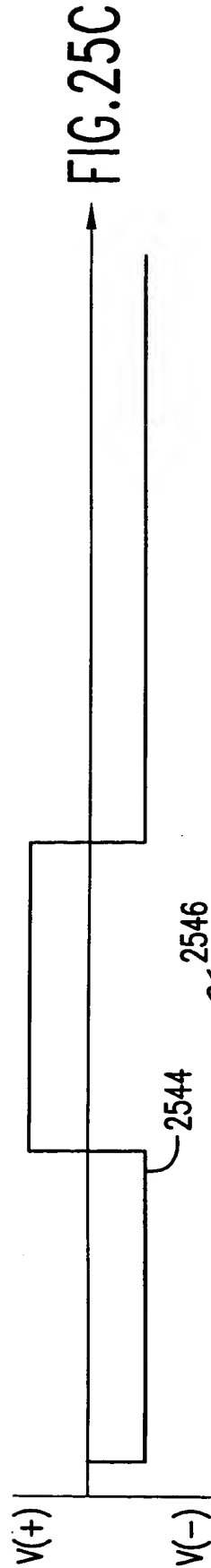
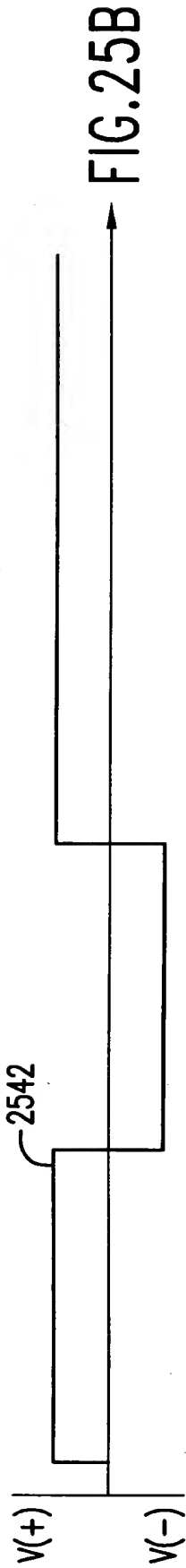


FIG. 24F







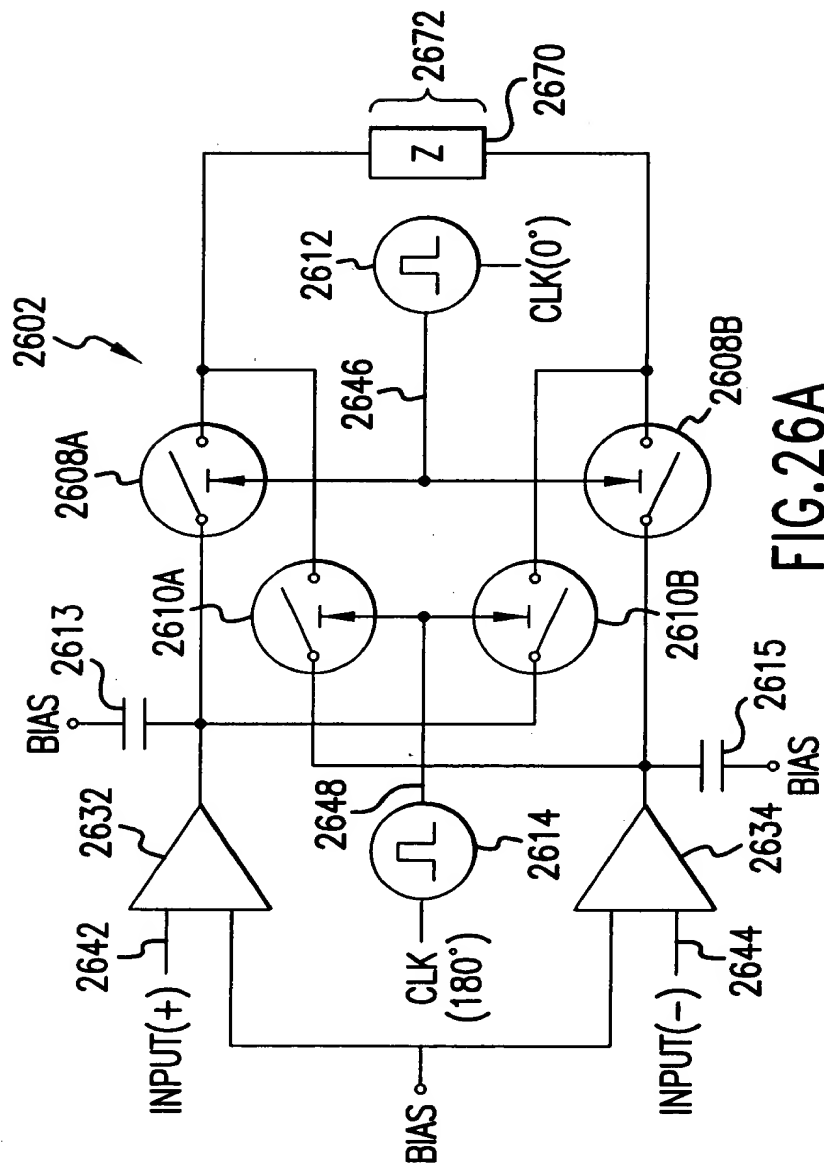
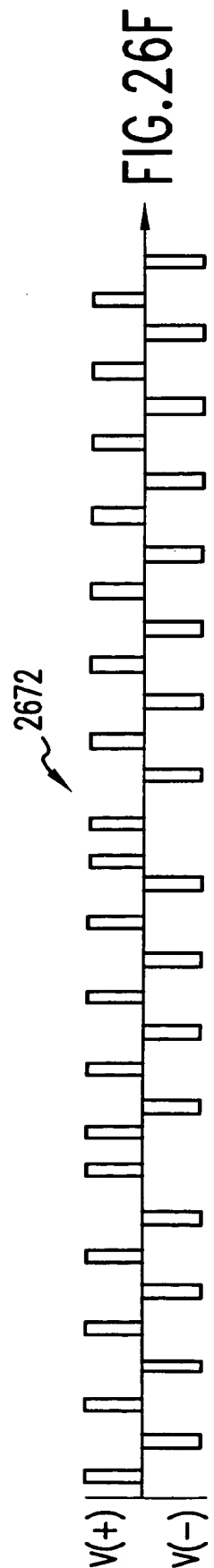
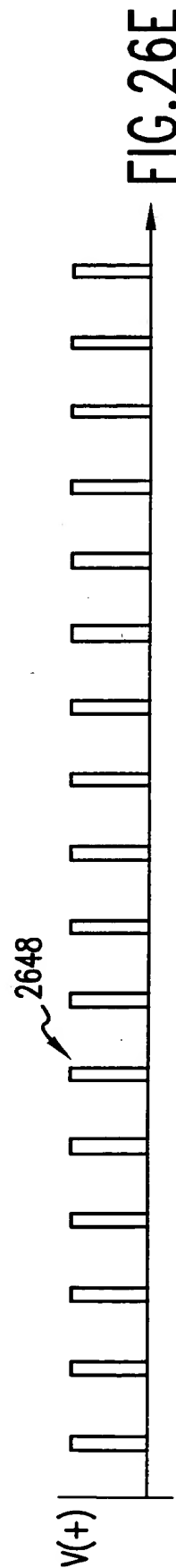
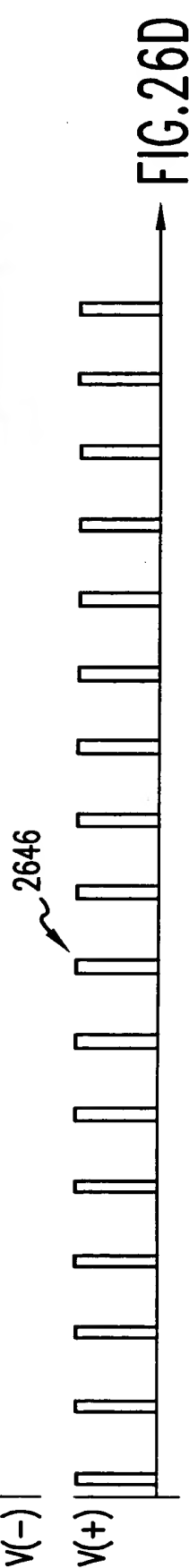
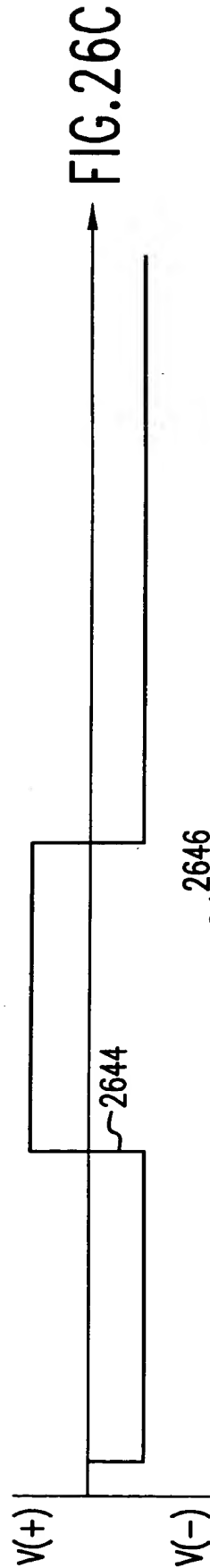
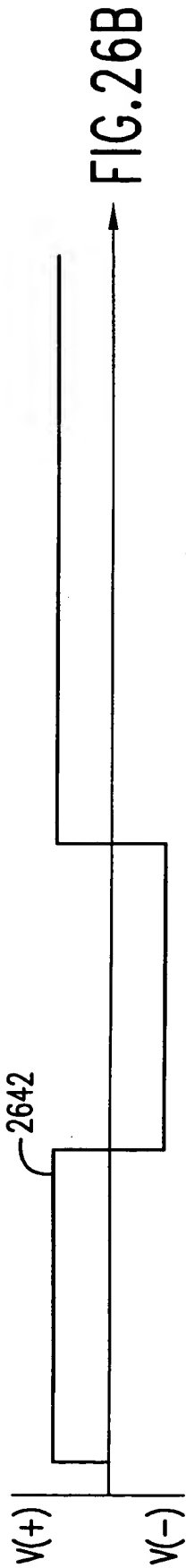


FIG. 26A



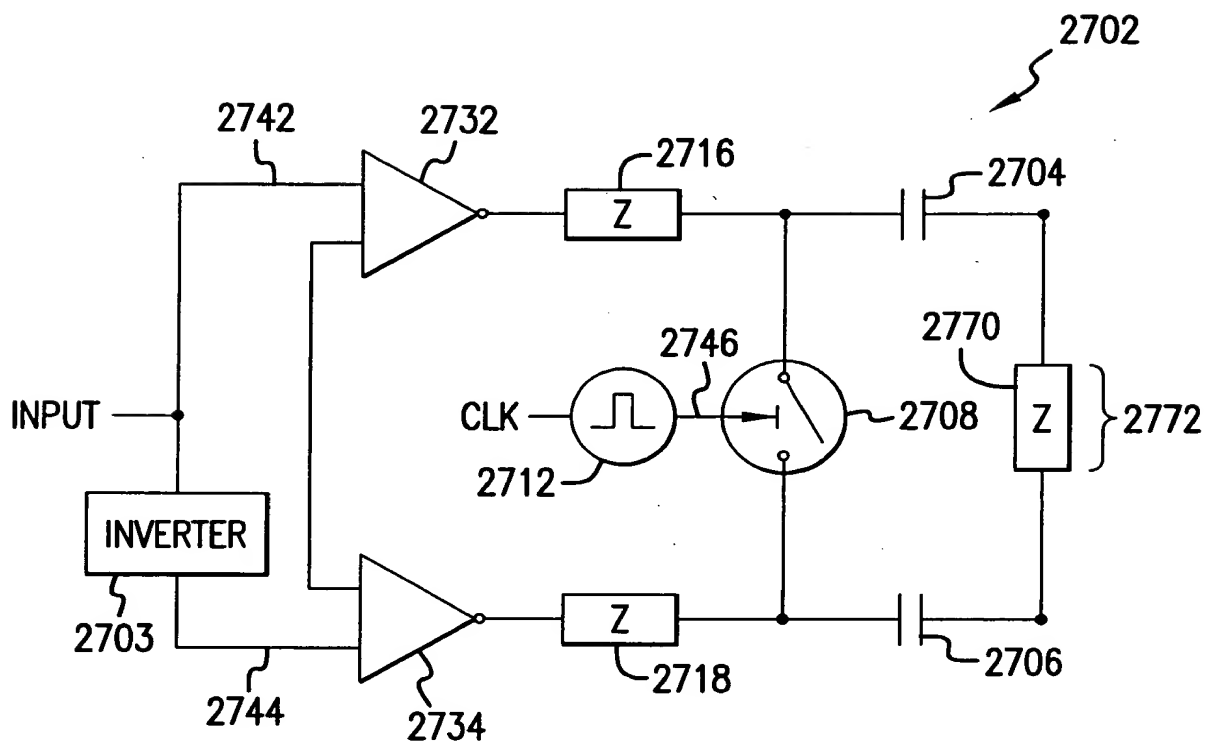
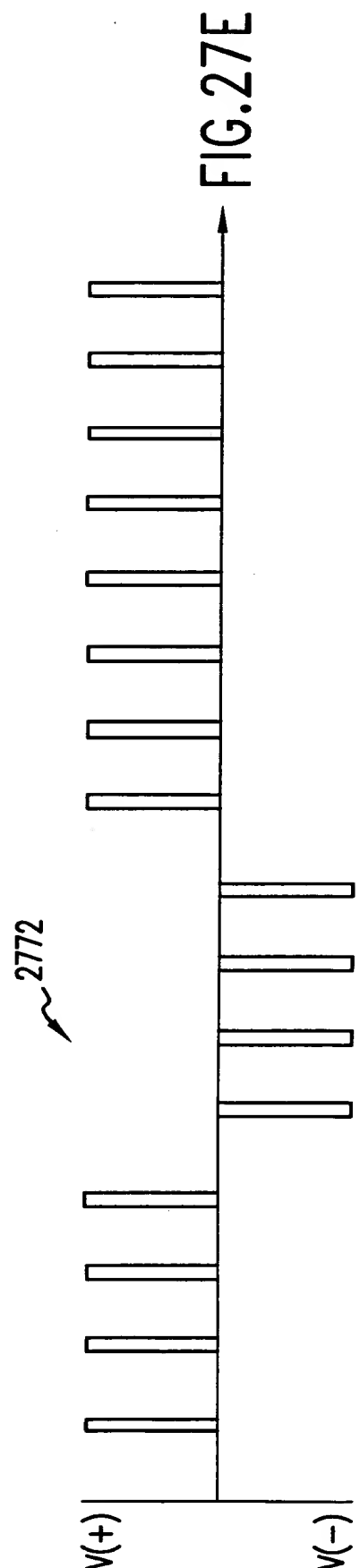
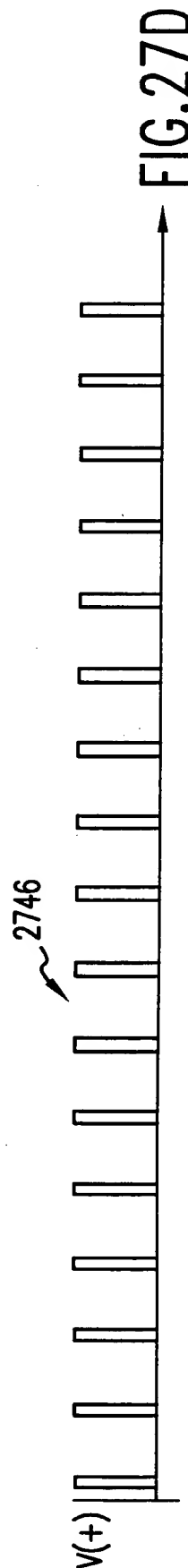
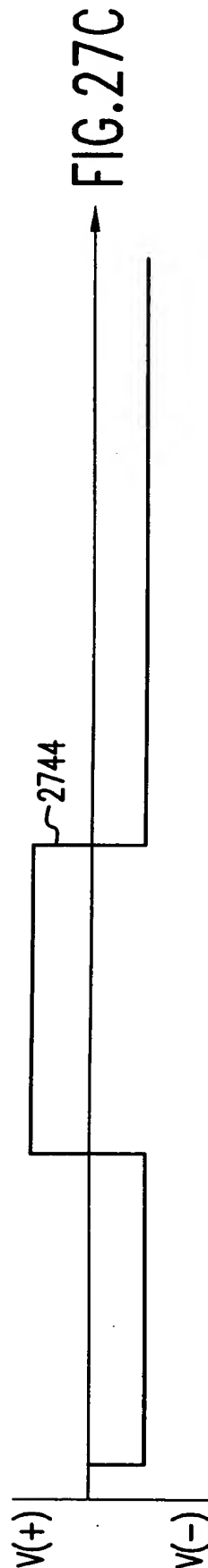
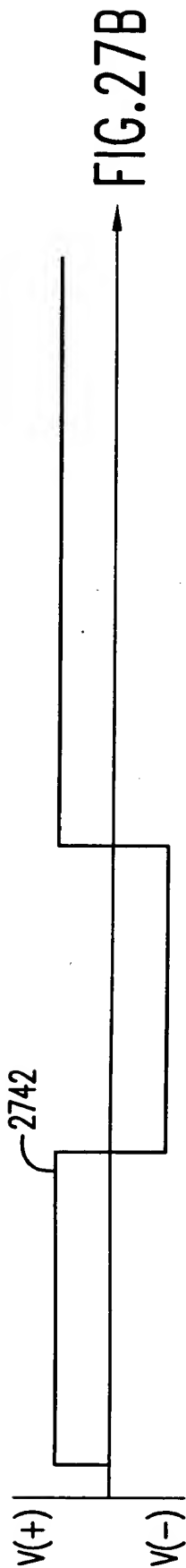
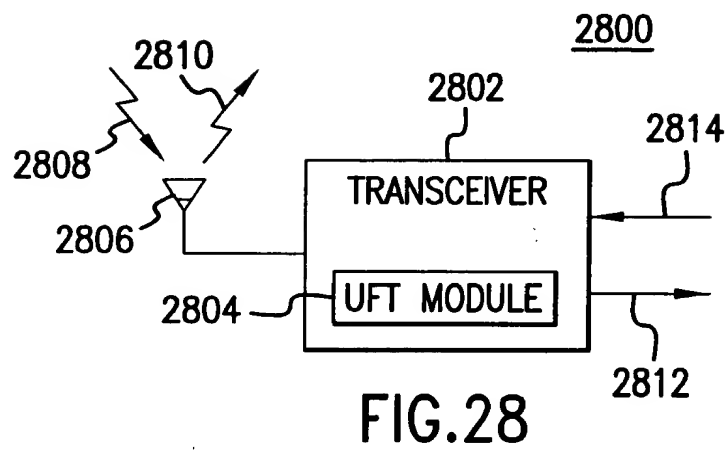


FIG. 27A



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EXEMPLARY RECEIVER FOR
 UNIVERSAL FREQUENCY DOWN-CONVERSION

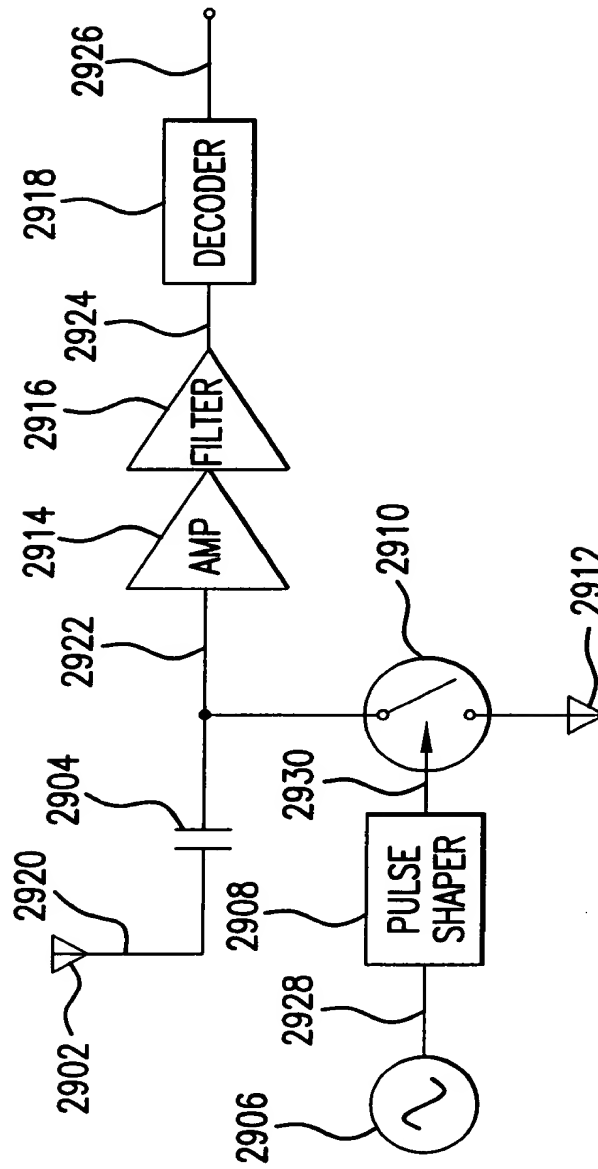


FIG. 29

EXEMPLARY TRANSMITTER USING
 THE PRESENT INVENTION

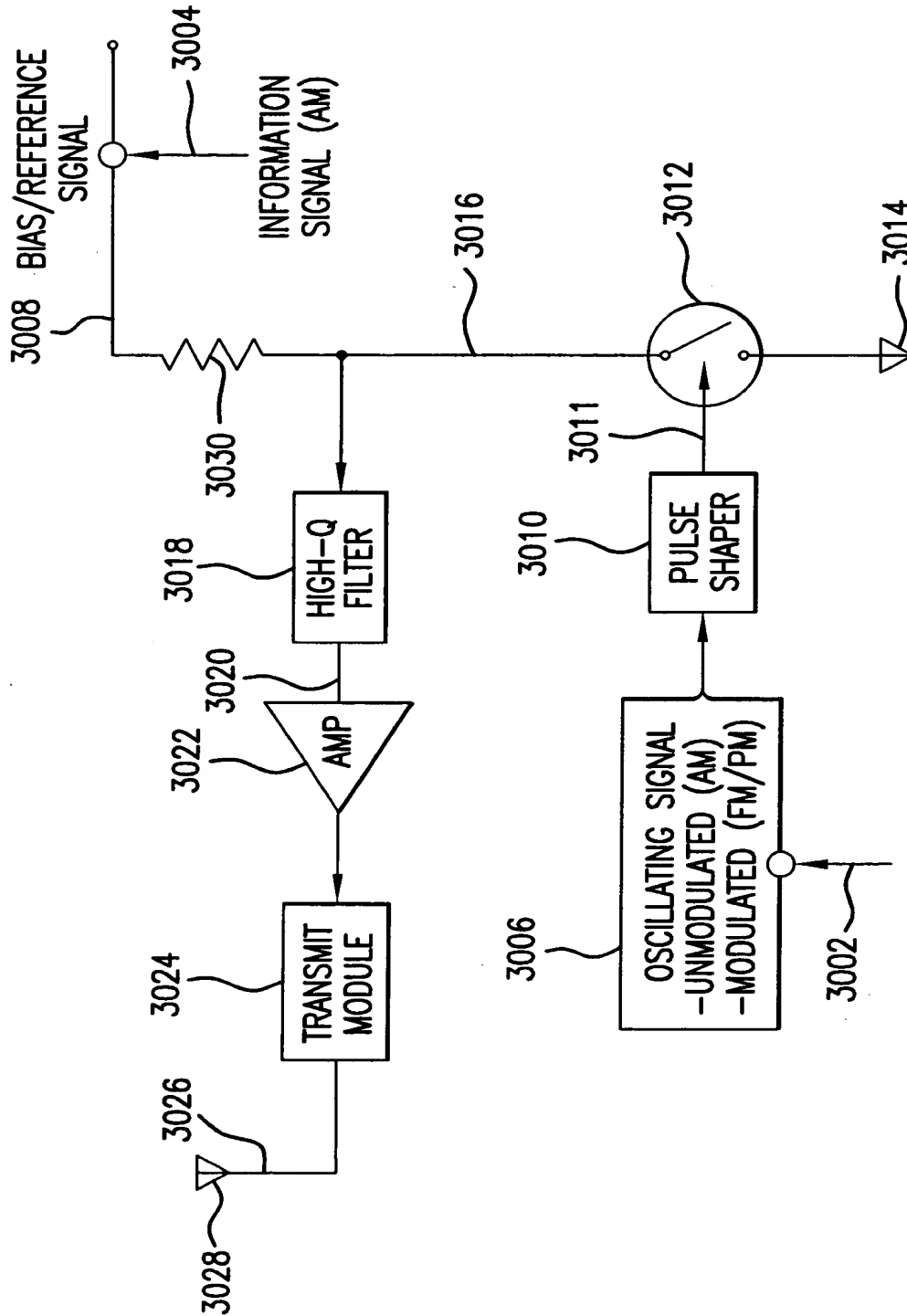
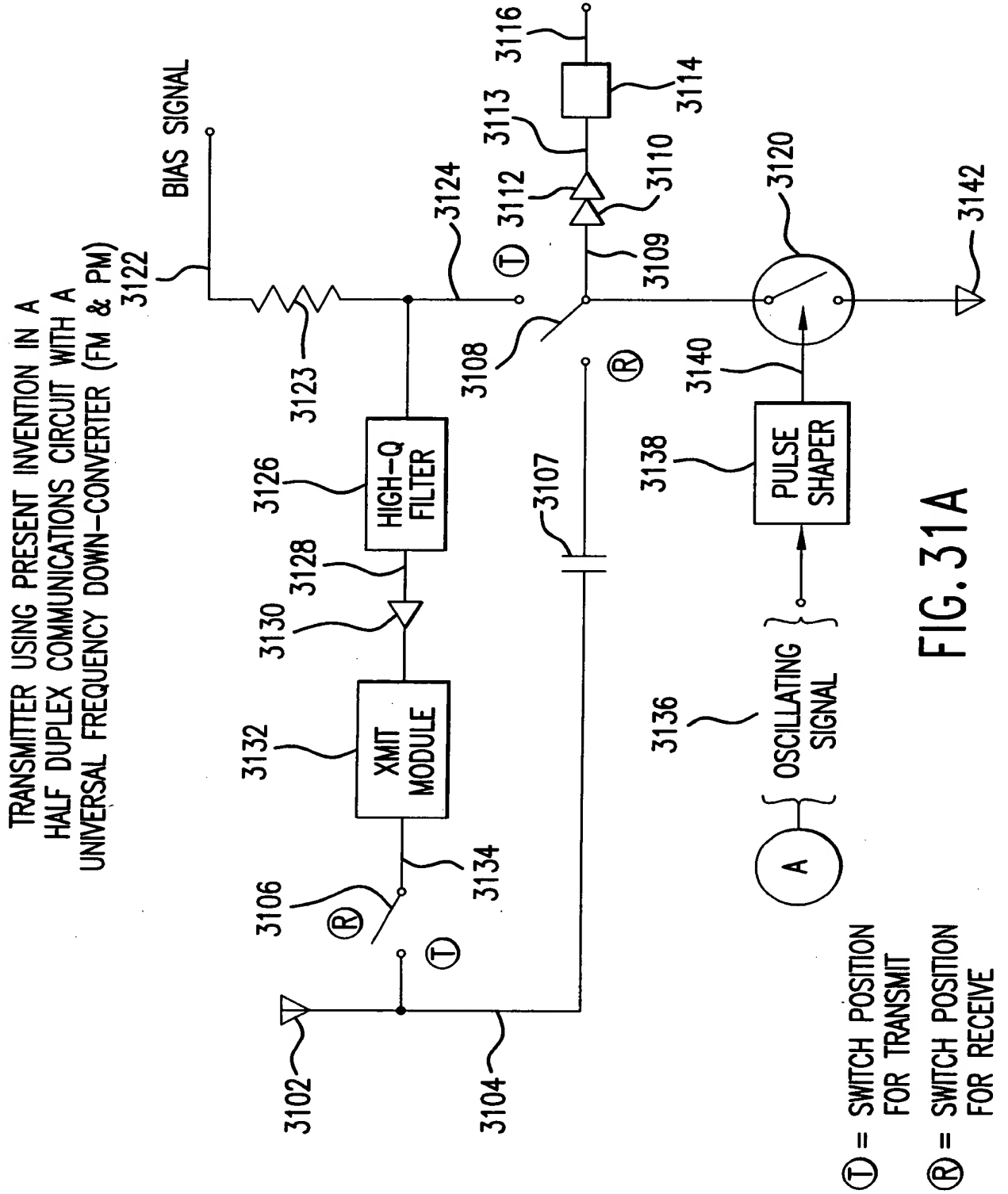
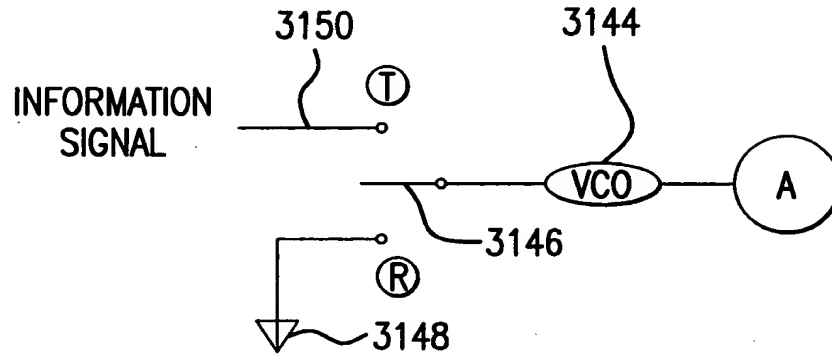


FIG. 30



FM MODE

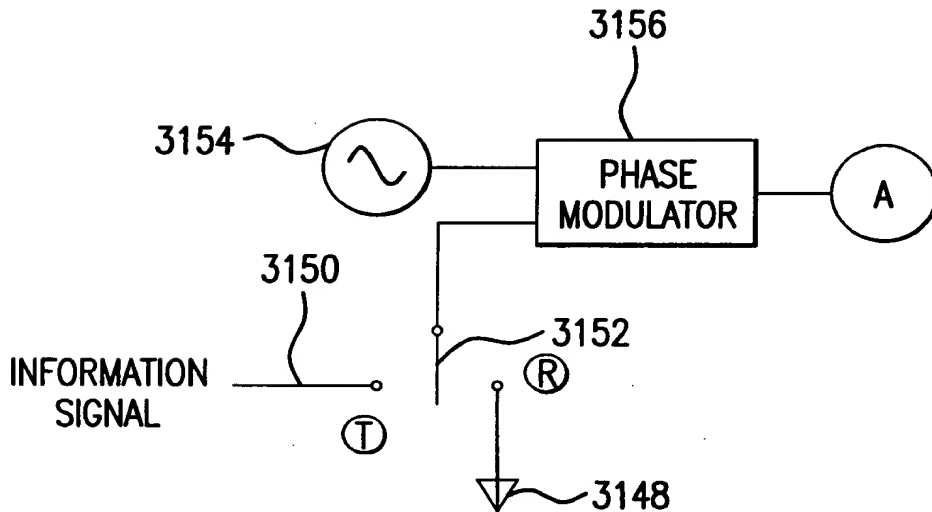


Ⓟ = SWITCH POSITION
FOR TRANSMIT

Ⓡ = SWITCH POSITION
FOR RECEIVE

FIG. 31B

PM MODE



Ⓟ = SWITCH POSITION
FOR TRANSMIT

Ⓡ = SWITCH POSITION
FOR RECEIVE

FIG. 31C

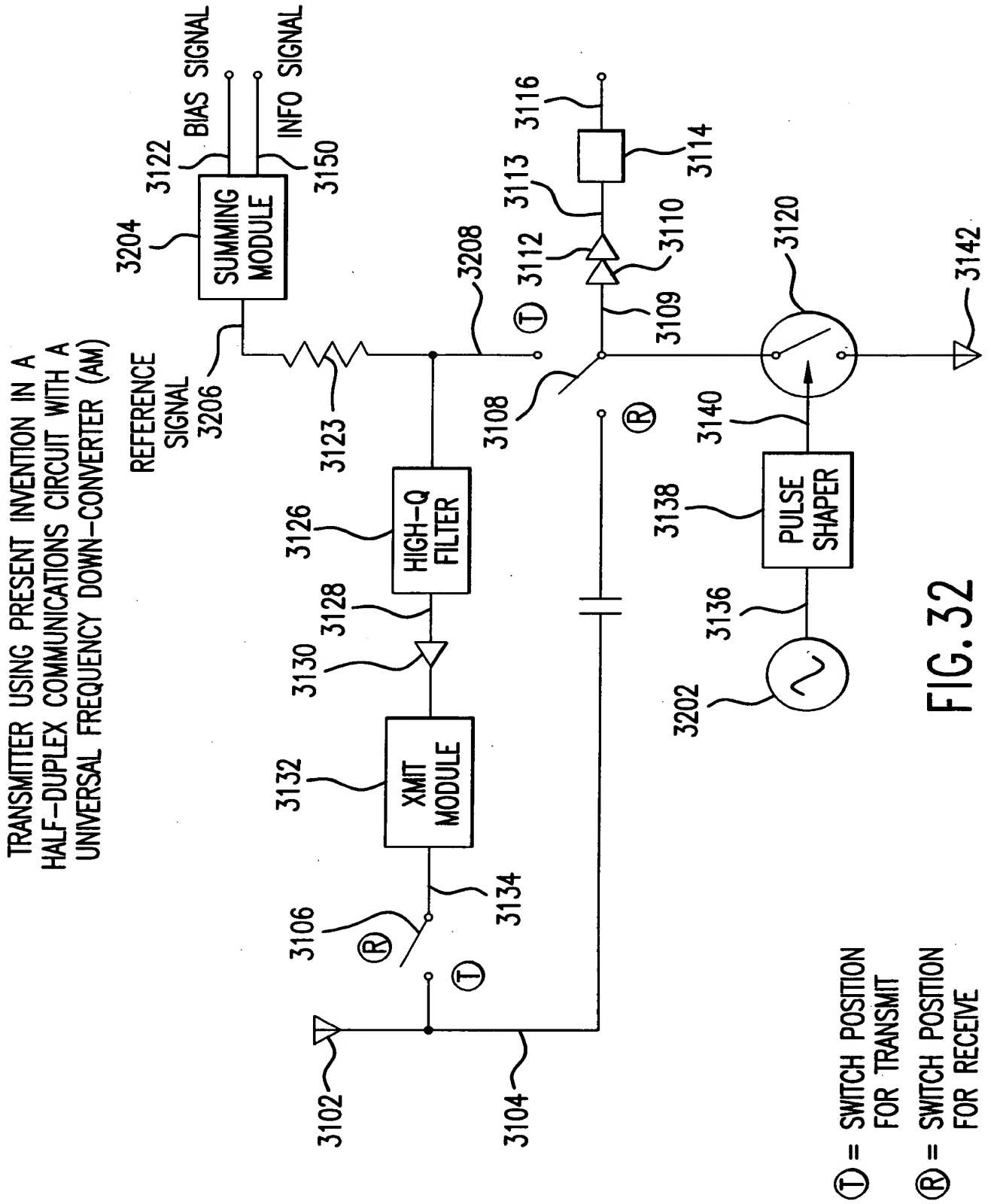
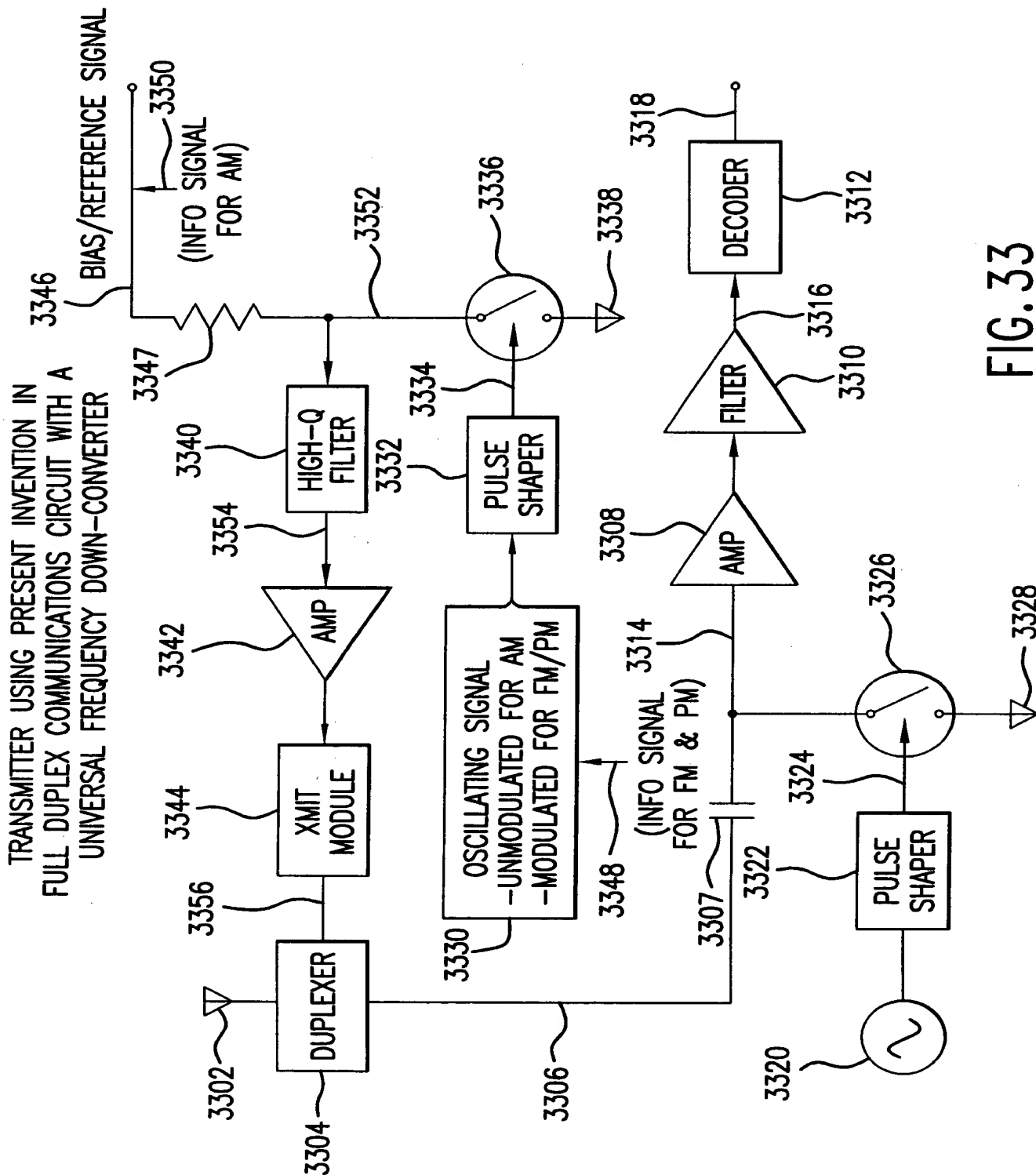


FIG. 32



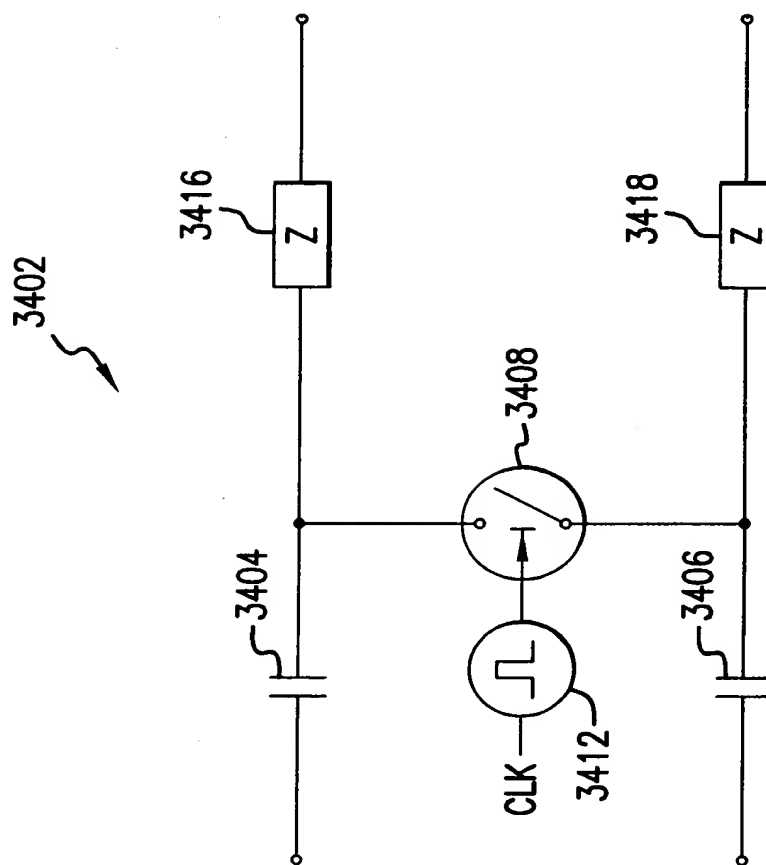


FIG. 34

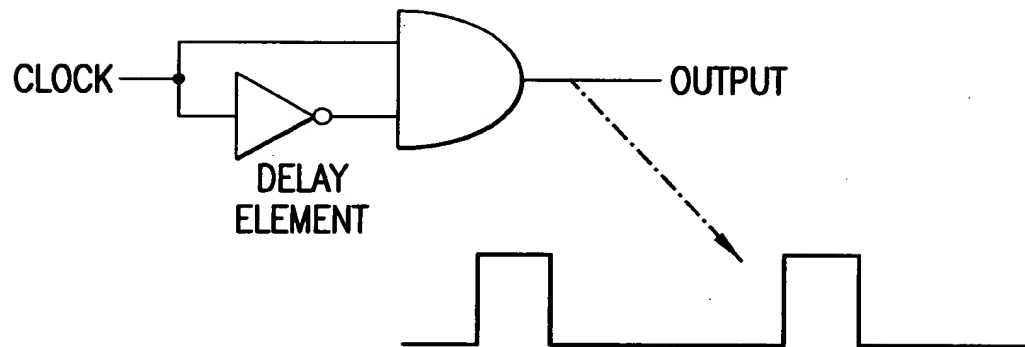
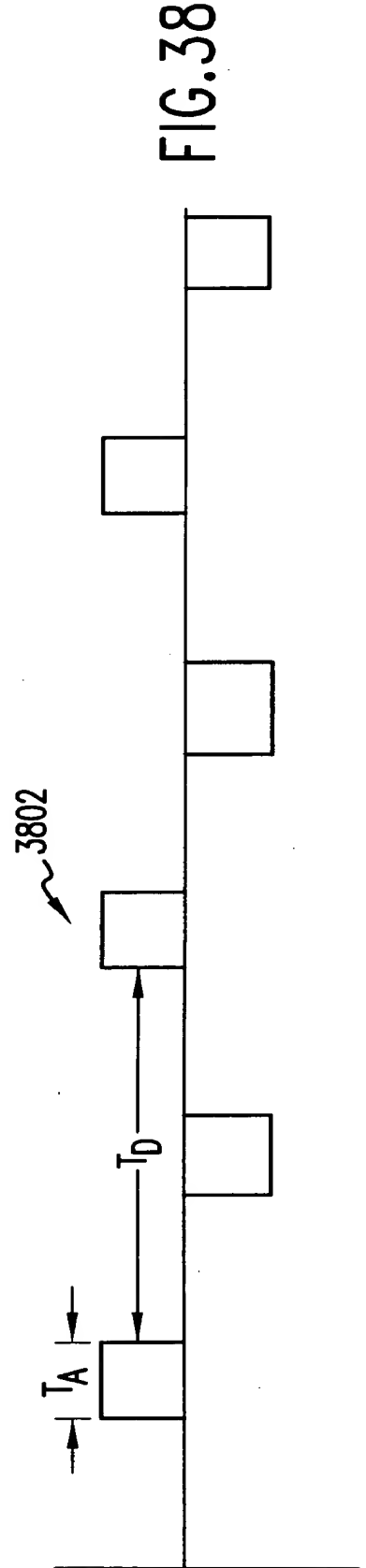
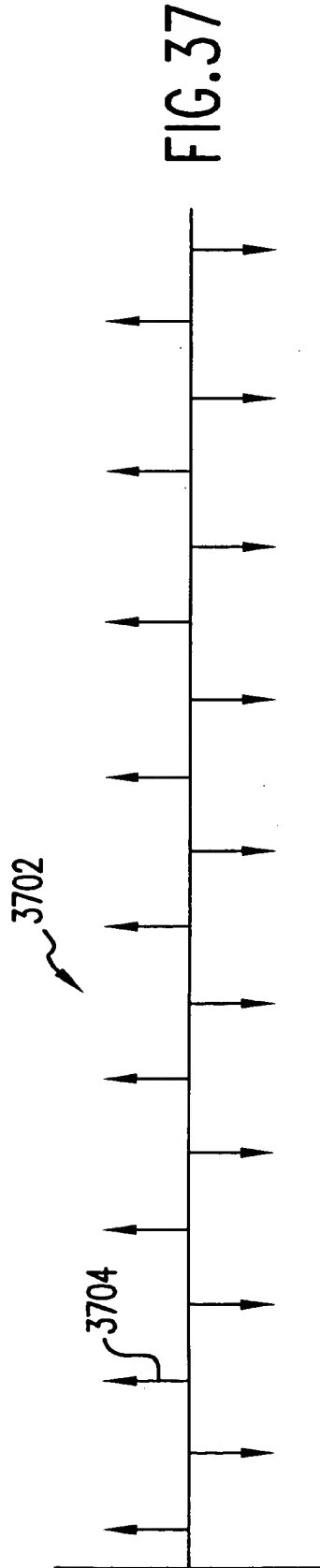
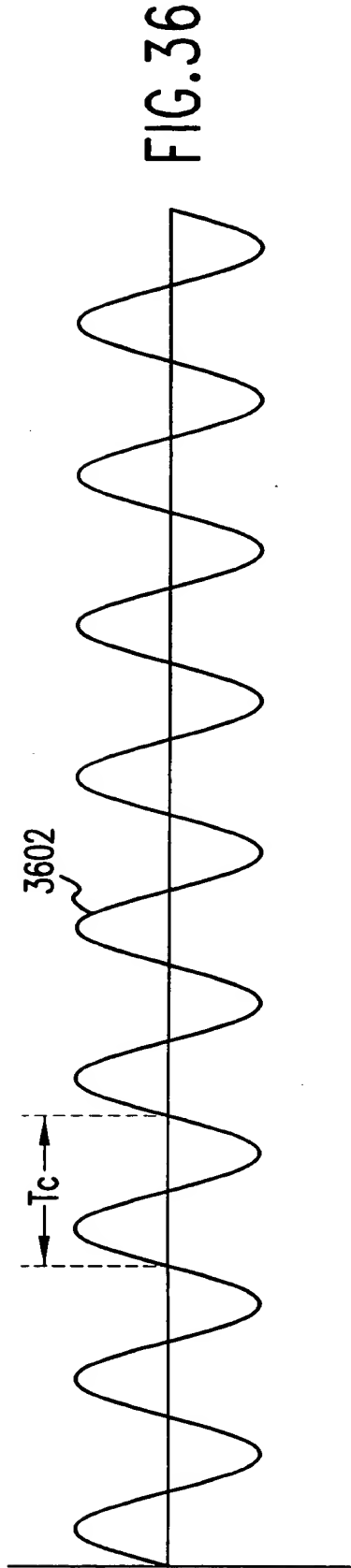
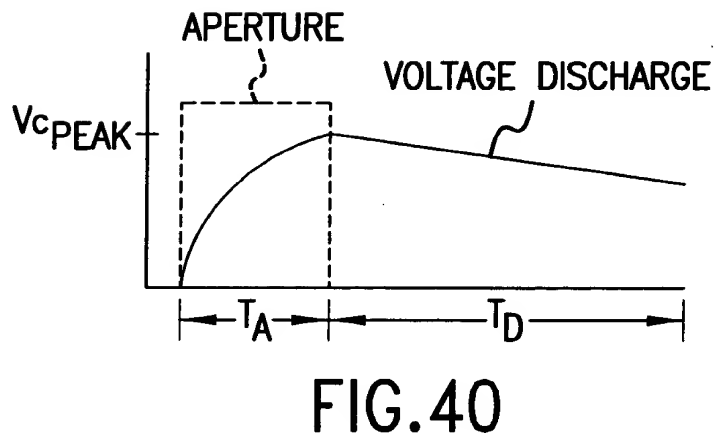
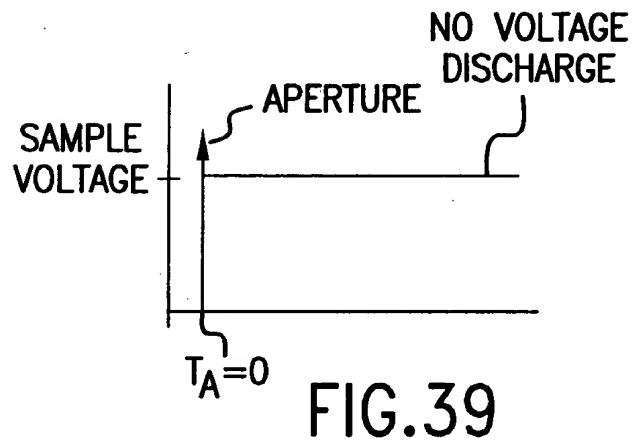


FIG.35





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 Inventor(s): Sorrells *et al.*; Tel: 202/371-2600
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 and Up-Converting Electromagnetic Signals

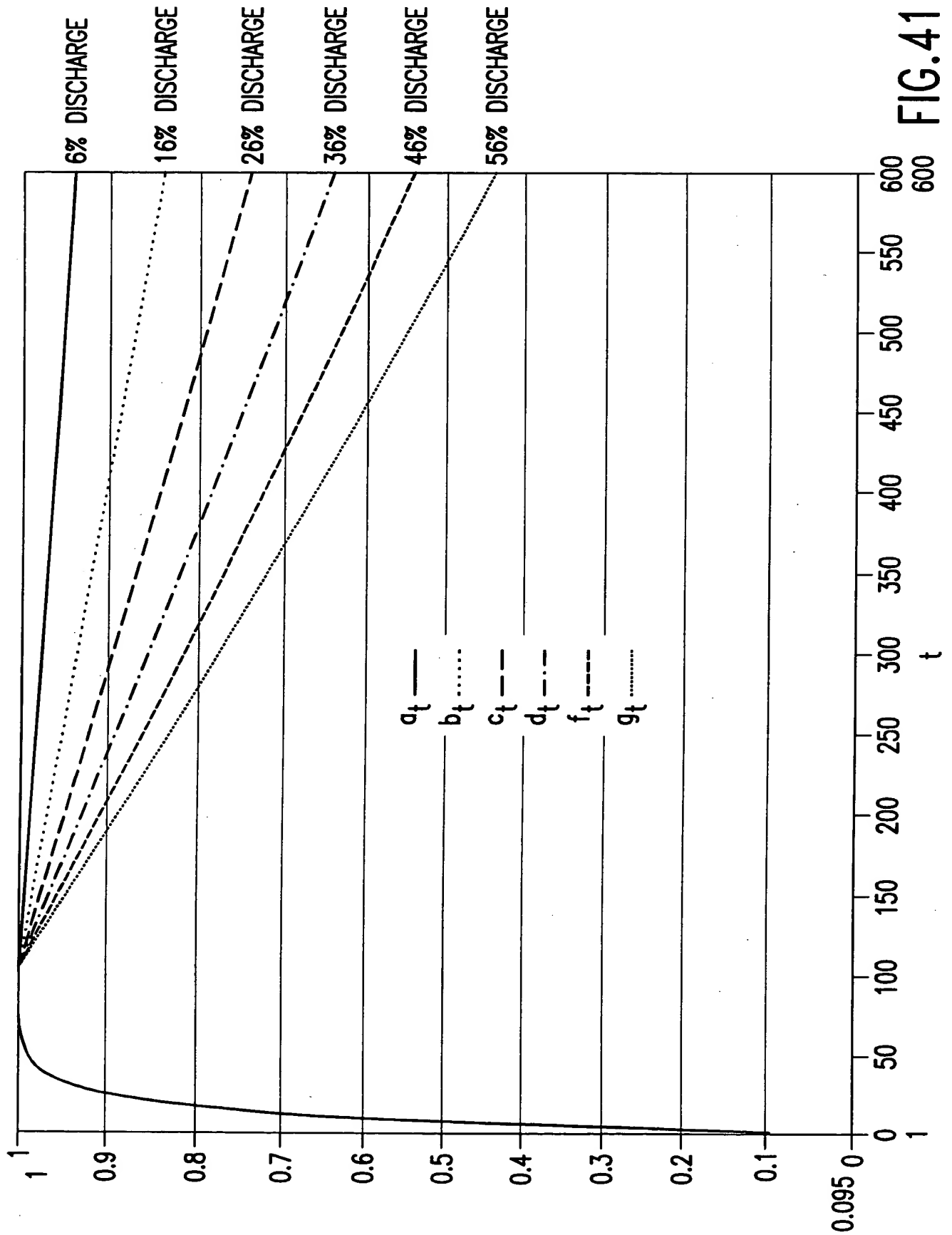


FIG.41

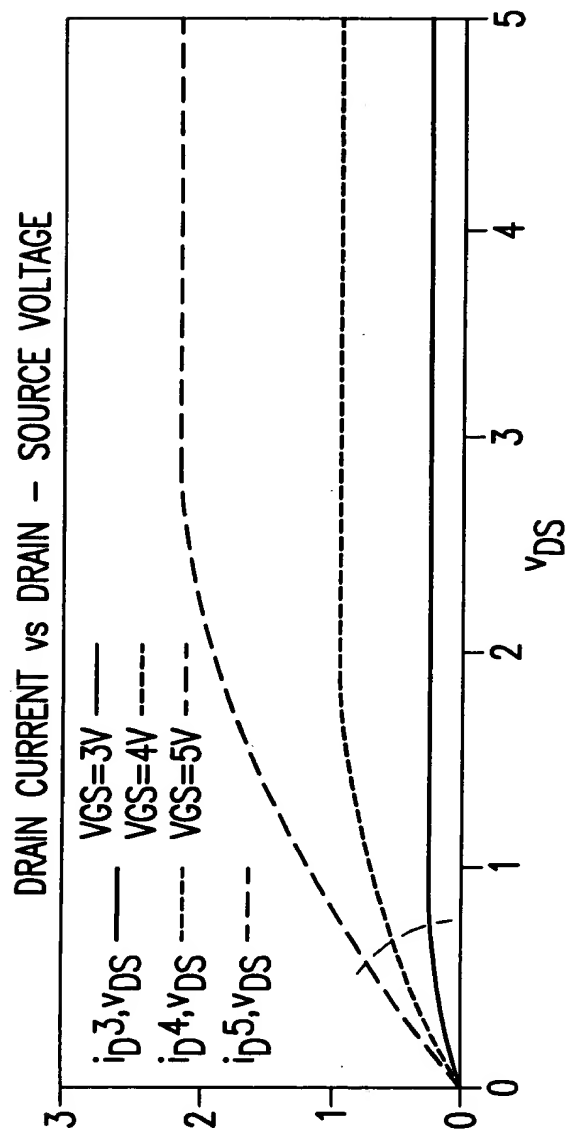


FIG.42

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 and Up-Converting Electromagnetic Signals

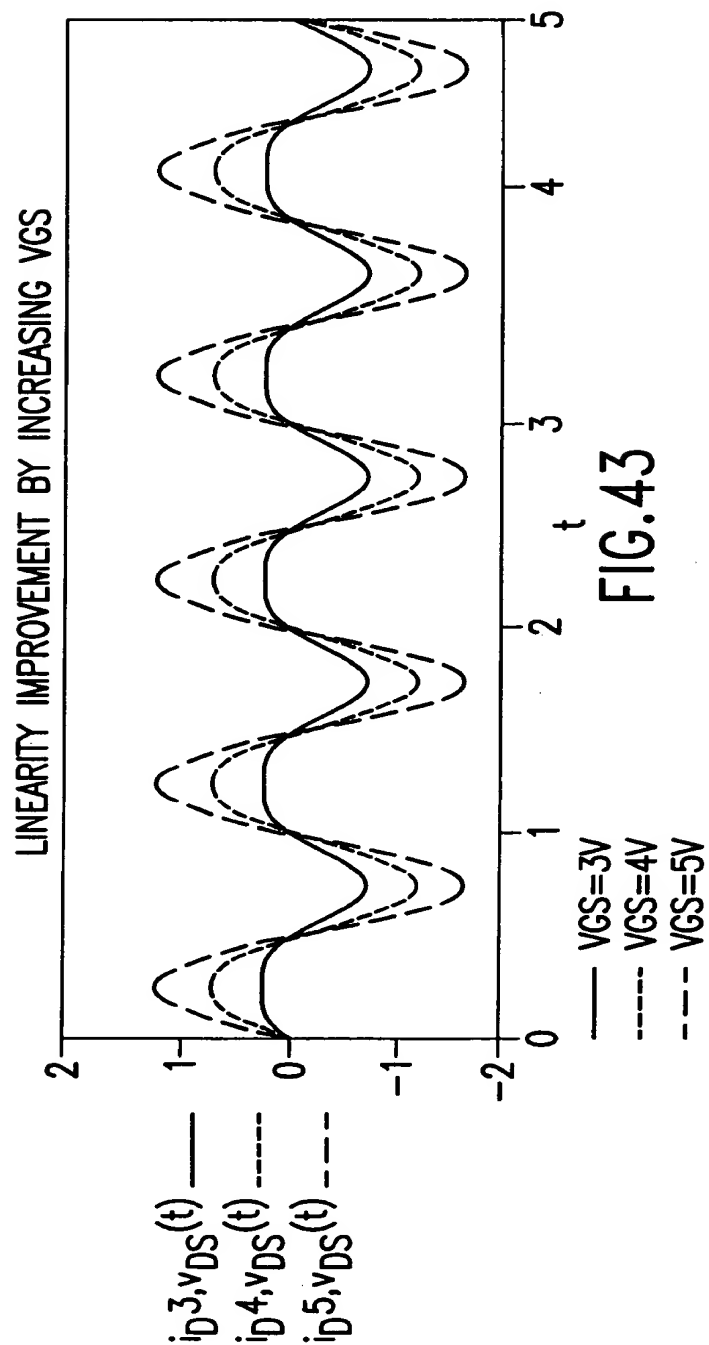


FIG.43

Appl. No. 09/855,851; Group Art Unit: 2681
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 Inventor(s): Sorrells *et al.*; Tel: 202/371-2600
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 and Up-Converting Electromagnetic Signals

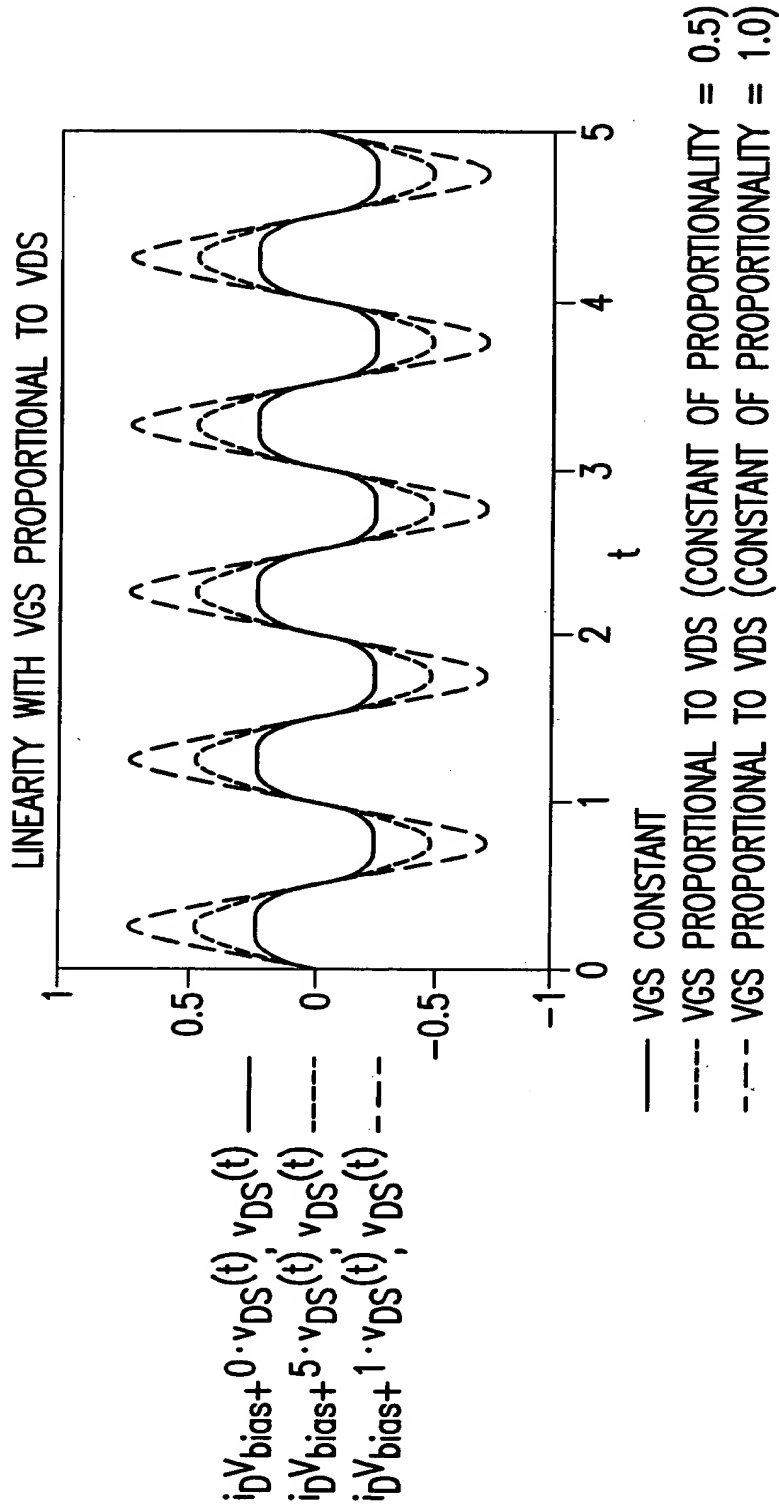


FIG.44

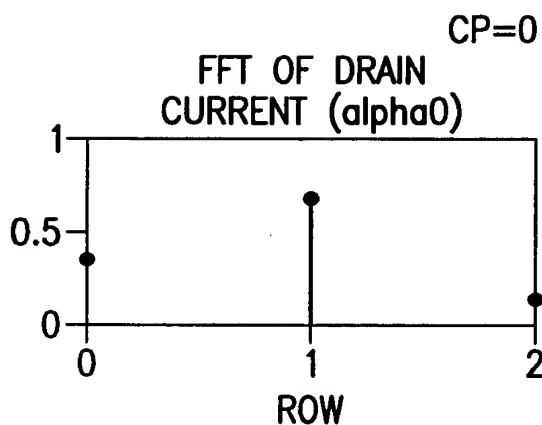


FIG.45A

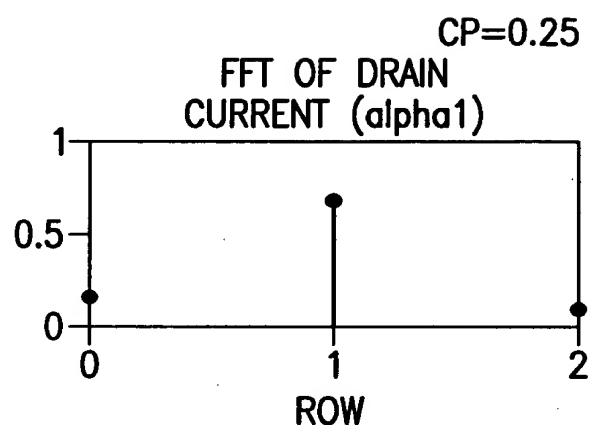


FIG.45B

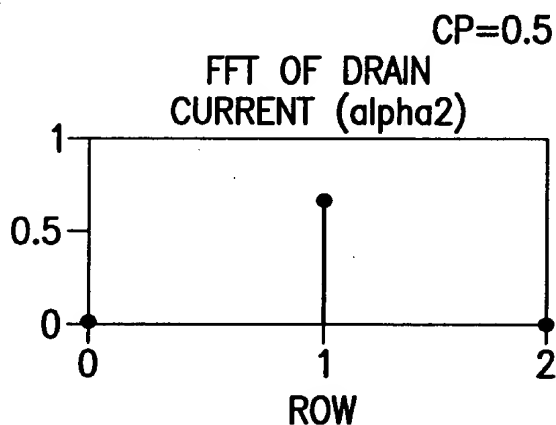


FIG.45C

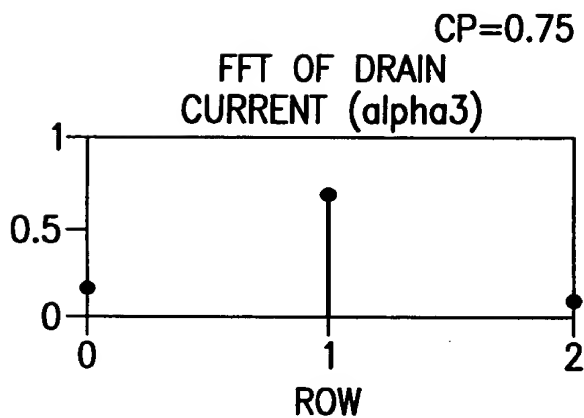


FIG.45D

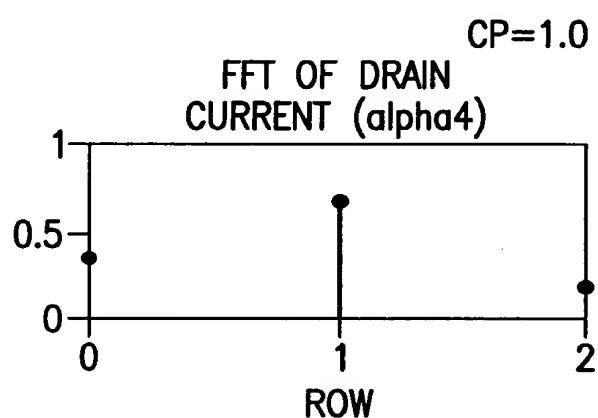


FIG.45E

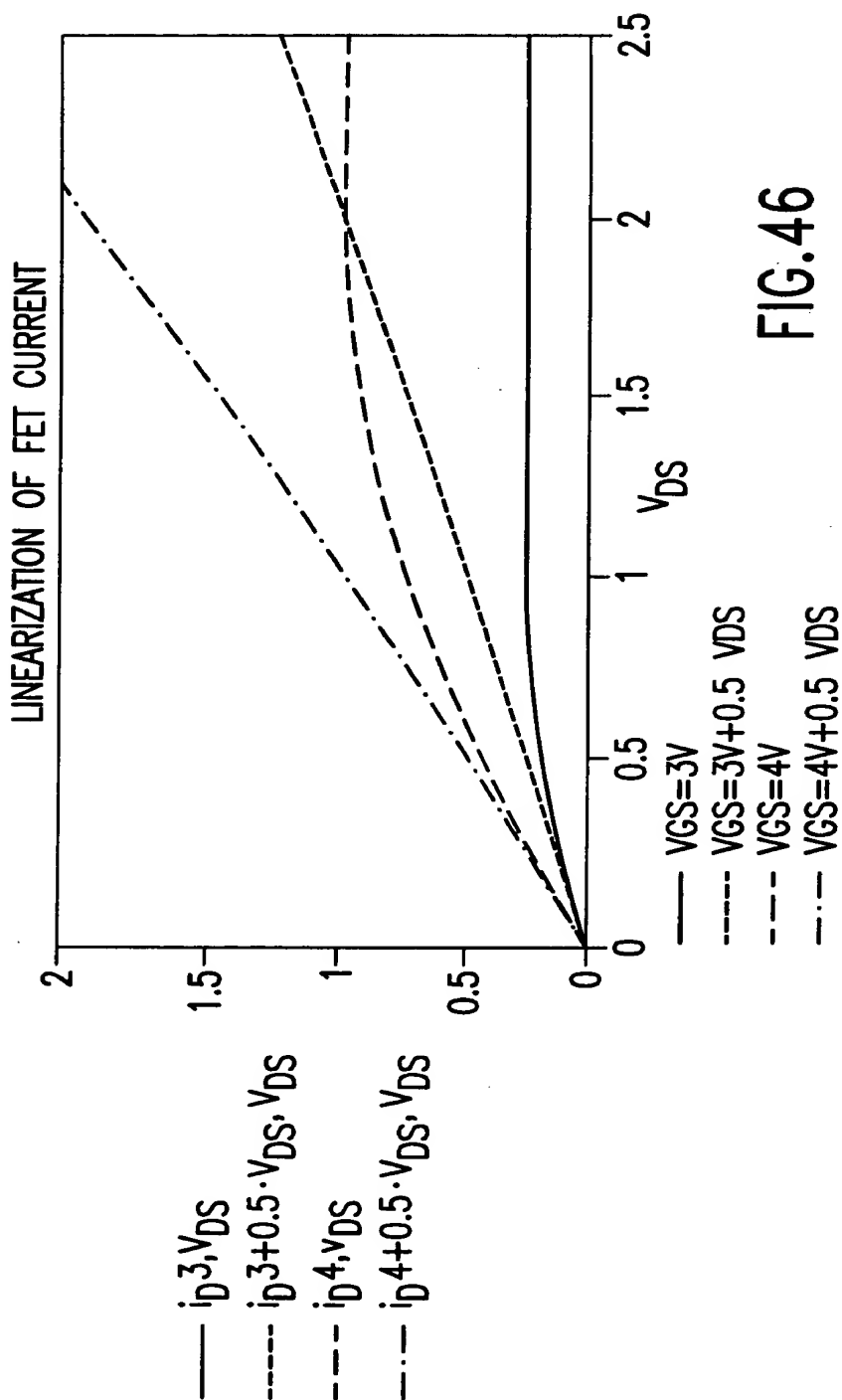


FIG.46

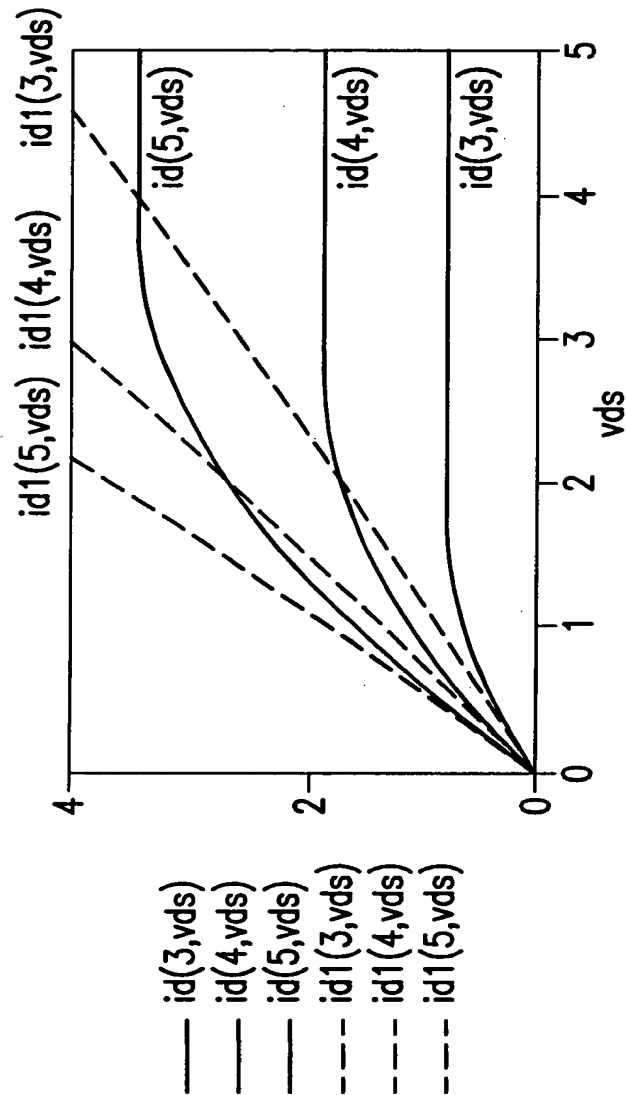


FIG.47

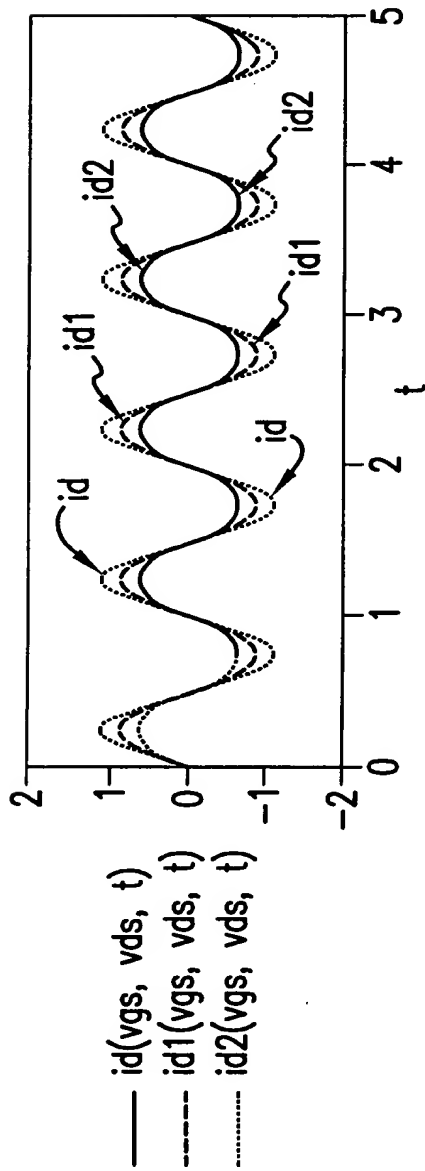


FIG.48

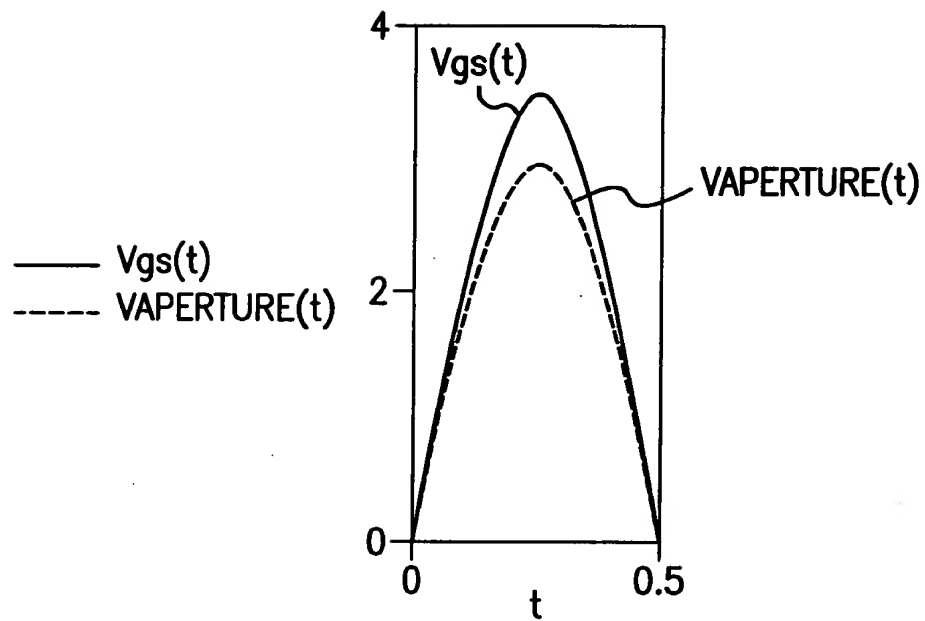


FIG.49

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 Inventor(s): Sorrells *et al.*; Tel: 202/371-2600
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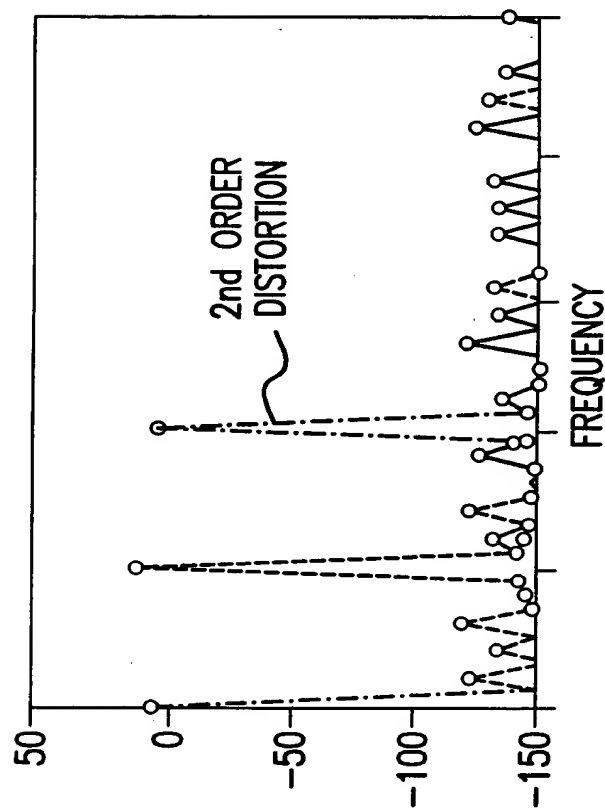
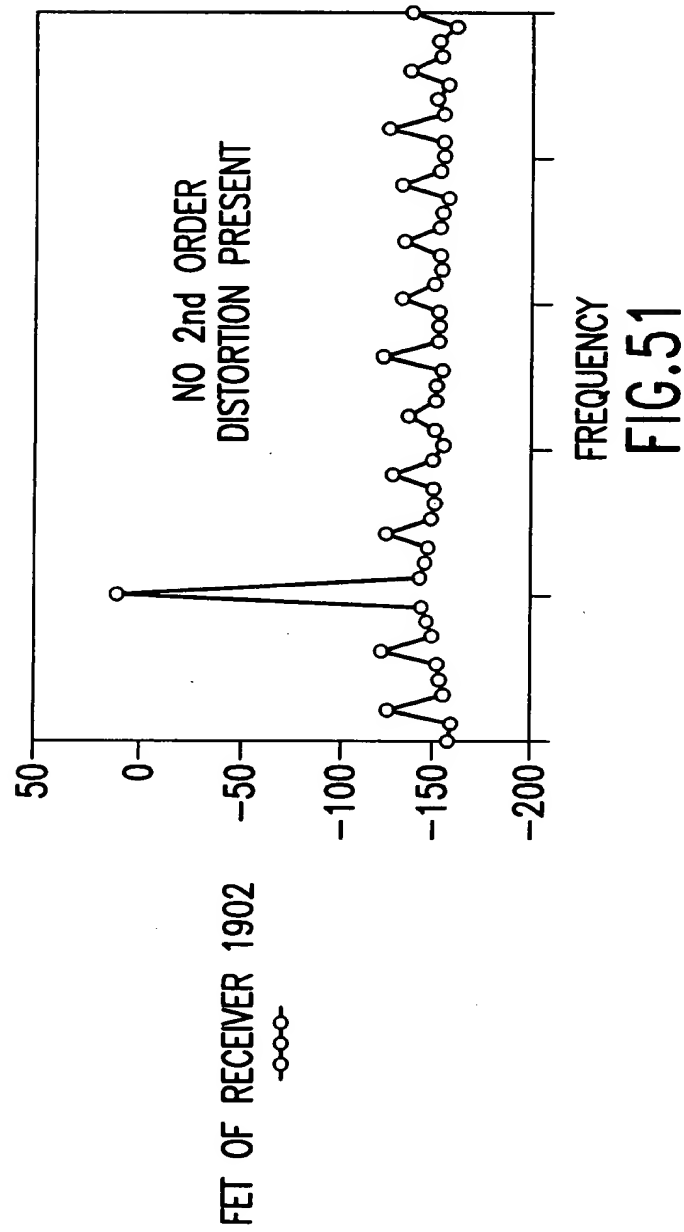


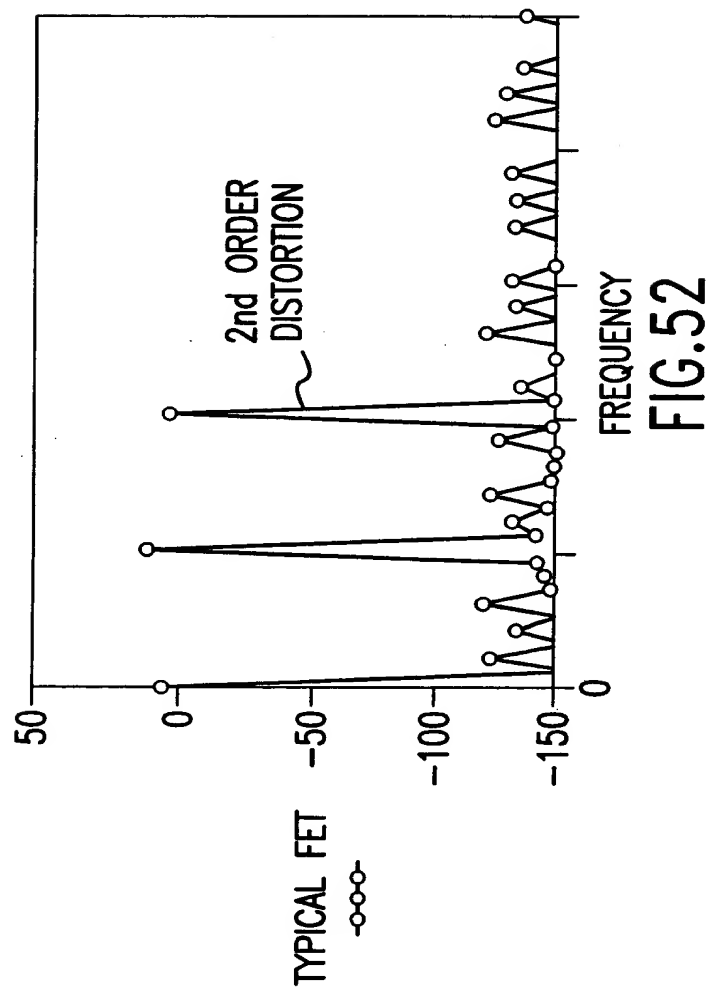
FIG. 50

---o--- TYPICAL FET
 ---o--- FET OF RECEIVER 1902
 ---o--- FET OF RECEIVER 2002

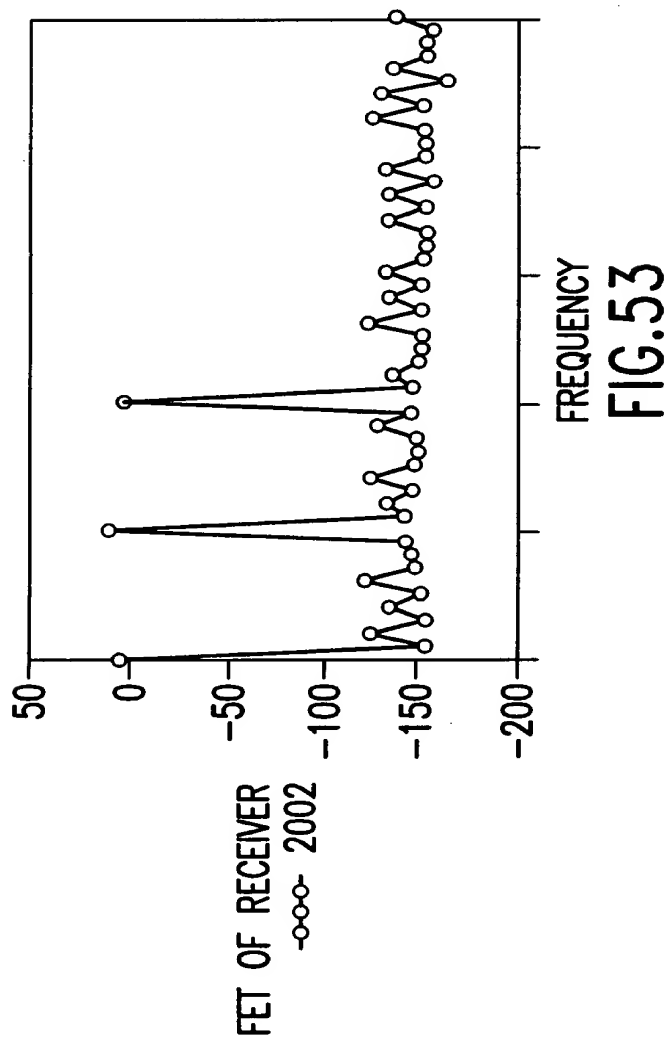
Appl. No. 09/855,851; Group Art Unit: 2681
 Dkt. No. 1744.1260001; Batch No.: (to be assigned)
 Inventor(s): Sorrells *et al.*; Tel: 202/371-2600
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 and Up-Converting Electromagnetic Signals



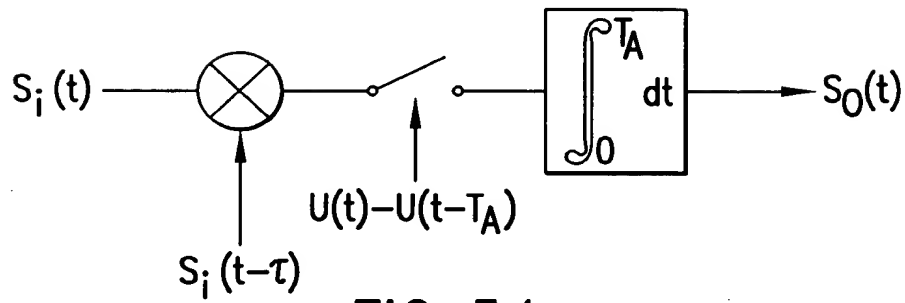


FIG. 54

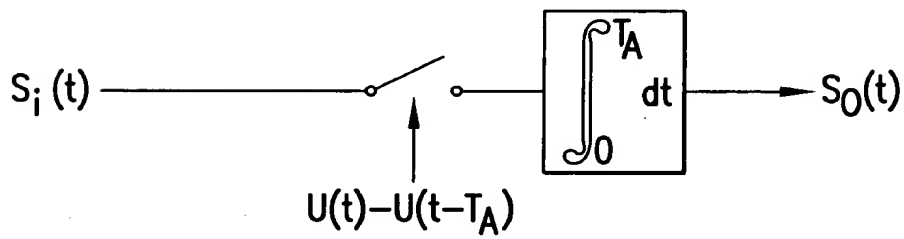


FIG. 55

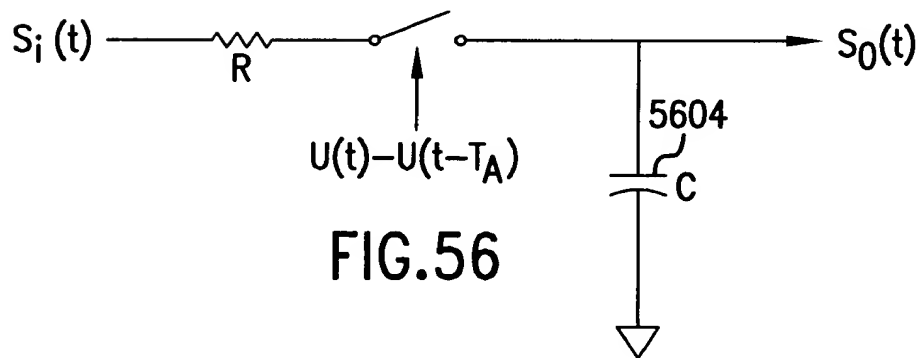
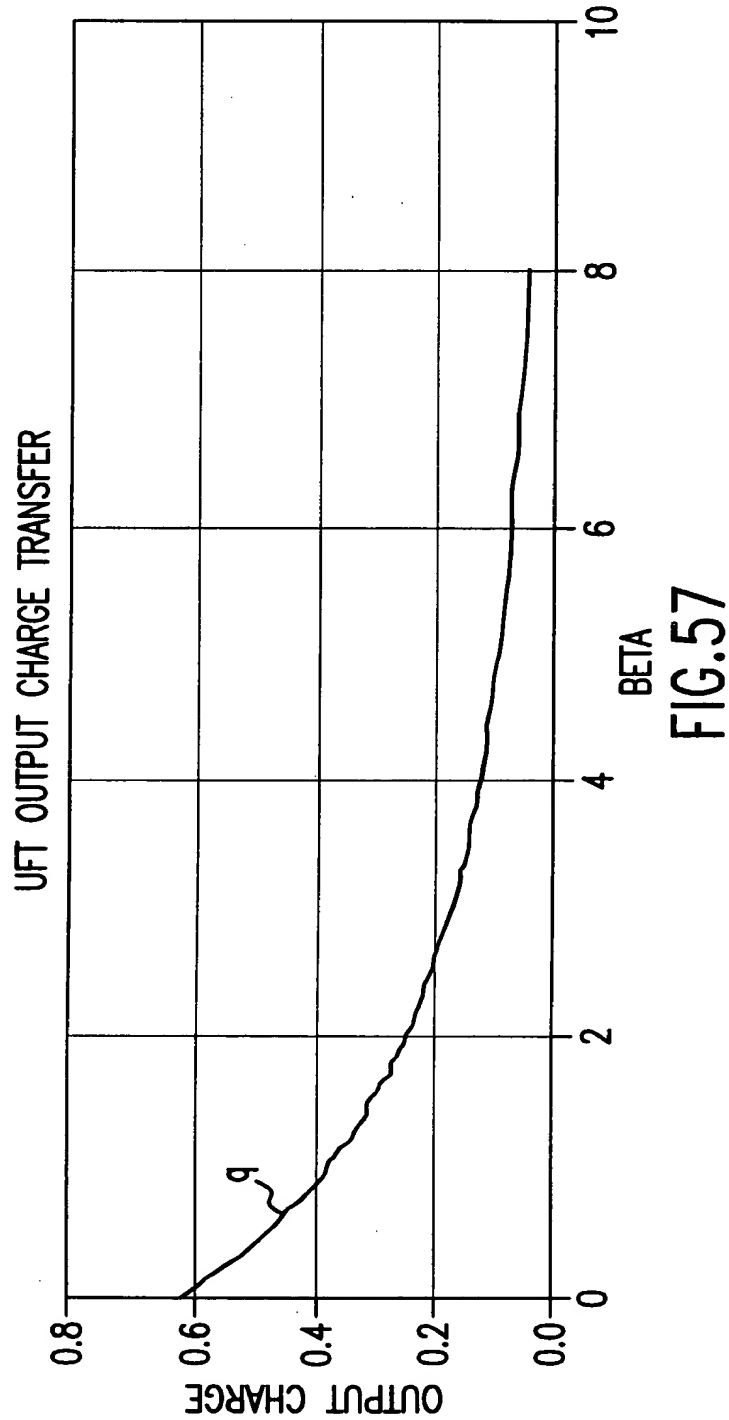


FIG. 56

Appl. No. 09/855,851; Group Art Unit: 2681
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 Inventor(s): Sorrells *et al.*; Tel: 202/371-2600
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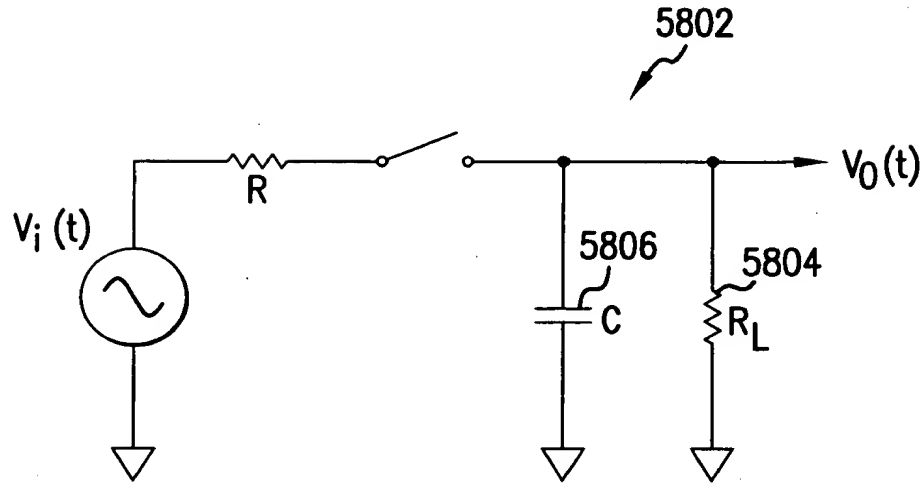


FIG.58

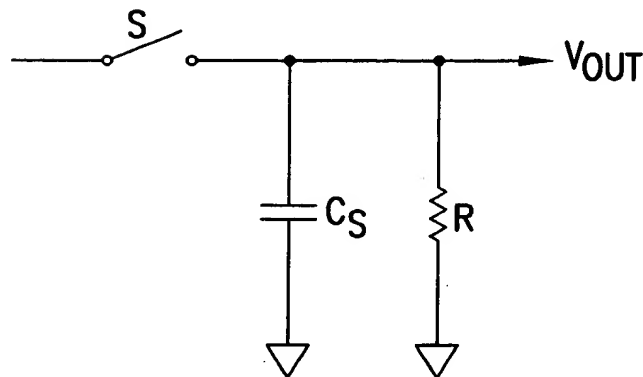


FIG.59

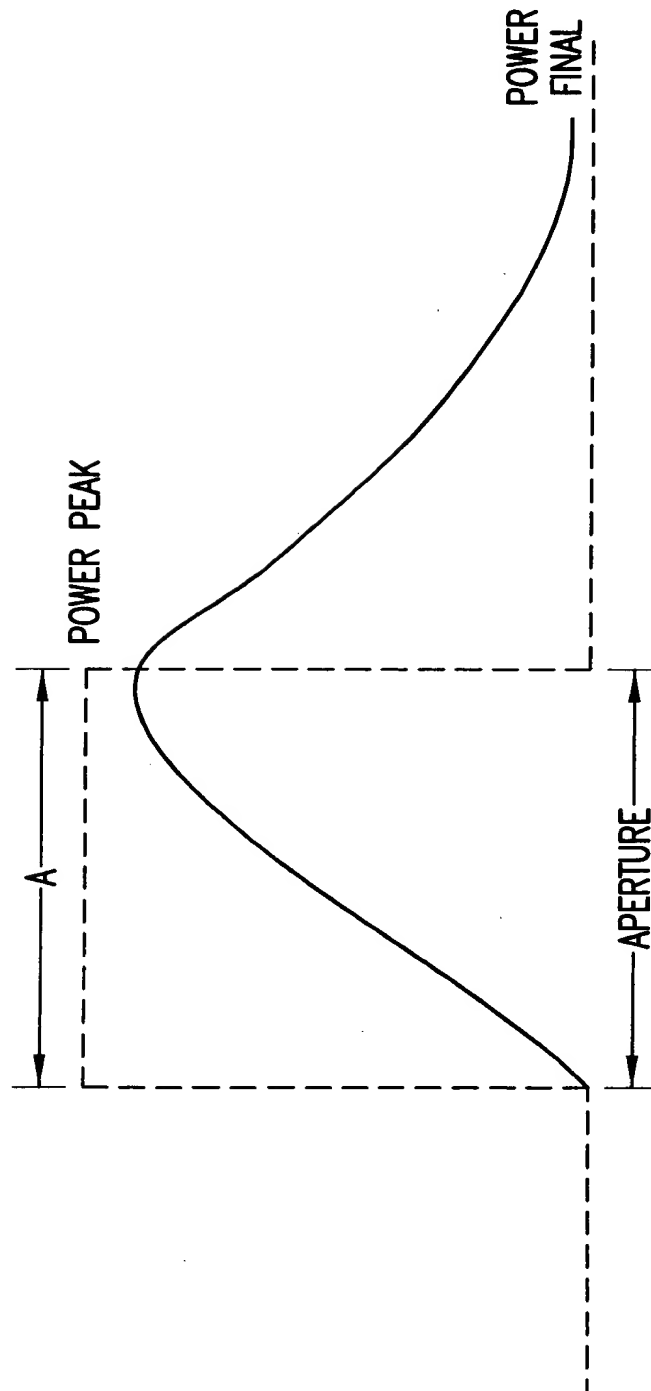
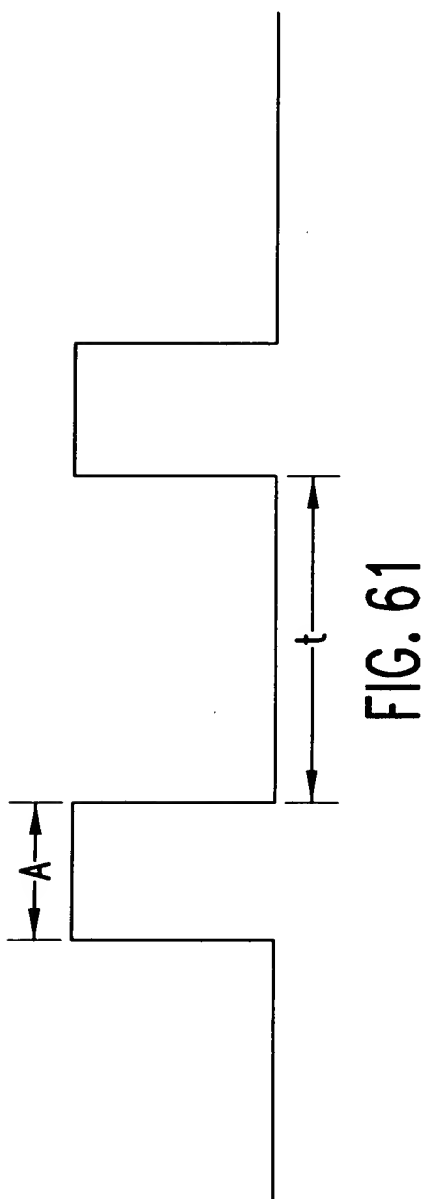


FIG. 60

Appl. No. 09/855,851; Group Art Unit: 2681
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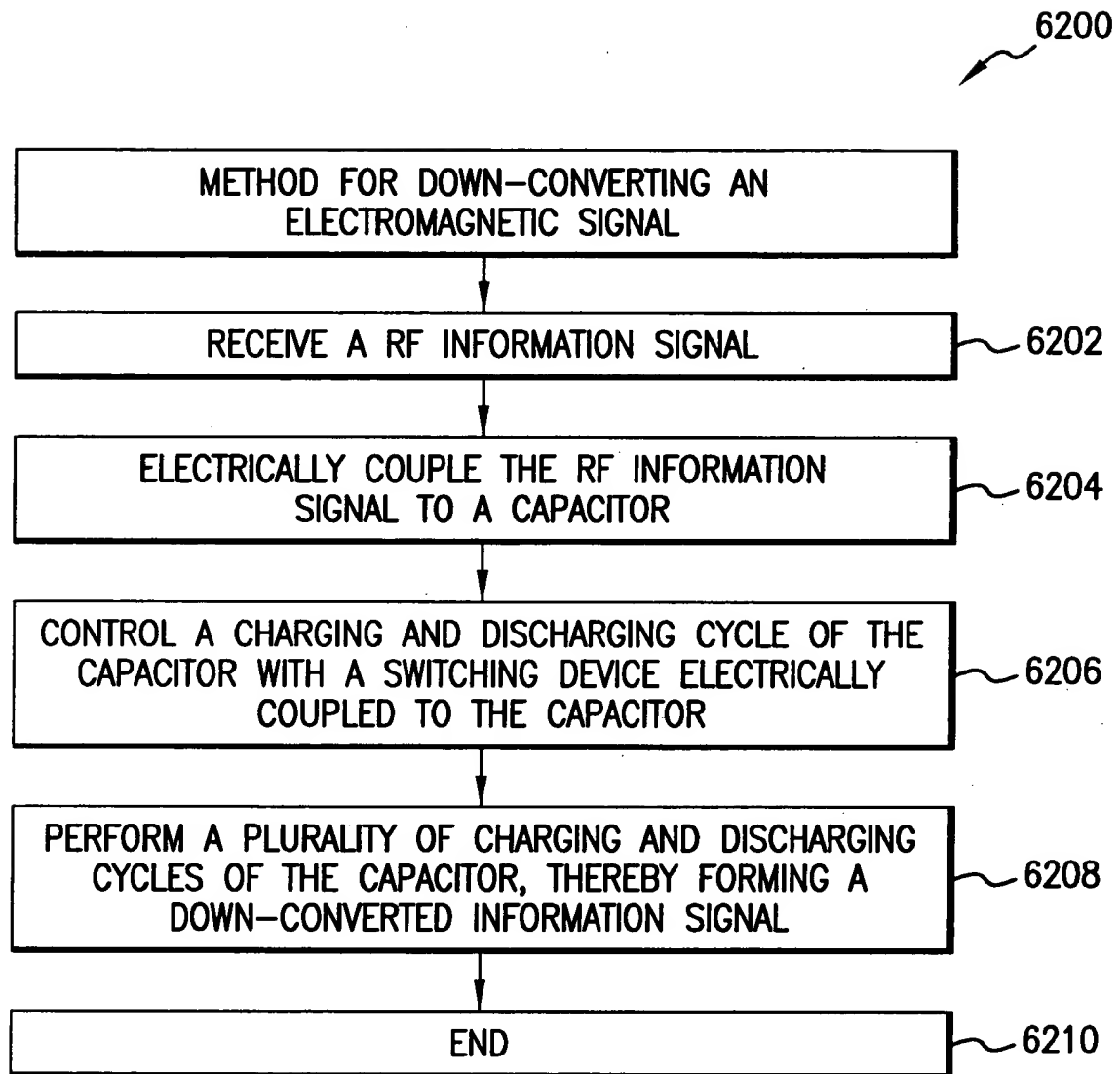


FIG.62